

# SOUTHERN POWER AND INDUSTRY

Ad Index, page 180

OCTOBER, 1953

## *In This Issue*

### 82 CASE STUDIES

Showing how production is being improved in Southern and Southwestern plants through better planning and improved use of modern equipment.

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*Sixth Annual  
Better Production  
Issue*

# Here Are Facts You Should Know About Electric Motor Bearings

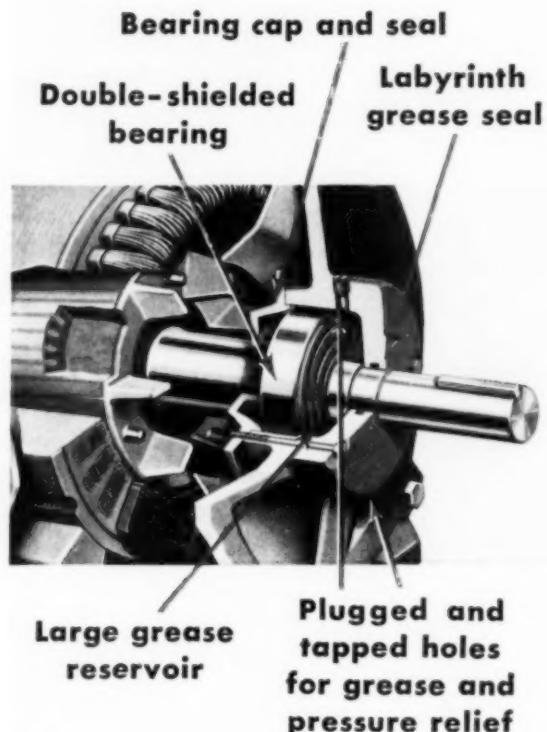
**A**N ideal motor bearing would operate for indefinitely long periods under all types of conditions without requiring any attention whatever. However, in the opinion of our engineers, such a bearing and its attendant lubricant are not yet available on the commercial market. Consequently, bearings for many types of operations, particularly where overloading, extreme temperature ranges and chemical and dirt laden atmospheres are involved, require special lubricants or regular lubrication schedules.

Of course, bearings suitable for many kinds of operation under normal conditions can be built to require no attention for very long periods — usually several years. Allis-Chalmers can supply sealed bearings in all frame sizes through 505 on short delivery and without extra cost for applications of this type.

## Which is the Best Design for Your Application?

*We believe that the design used in standard Allis-Chalmers drip-proof, tefc and explosion-proof motors represents the best design for most industrial users.*

The Allis-Chalmers standard design consists of a pre-lubricated, double-shielded bearing mounted in the end housing with a generous grease reservoir. Plugged and tapped holes are provided for grease and for pressure relief. Under normal operating conditions, this design will operate as long without attention as any other type of bearing in use today. But where difficult operating conditions make re-lubrication desirable, it can be done as part of the normal lubricating routine without dismantling the motor.



The large grease reservoir and shielded bearing design assure that grease lost from the bearing due to high operating temperatures or other causes will be replaced automatically.

For further information on bearing design and other features of Allis-Chalmers motors, call your nearby Allis-Chalmers District Office or Authorized Distributor.

A 4147

# ALLIS-CHALMERS

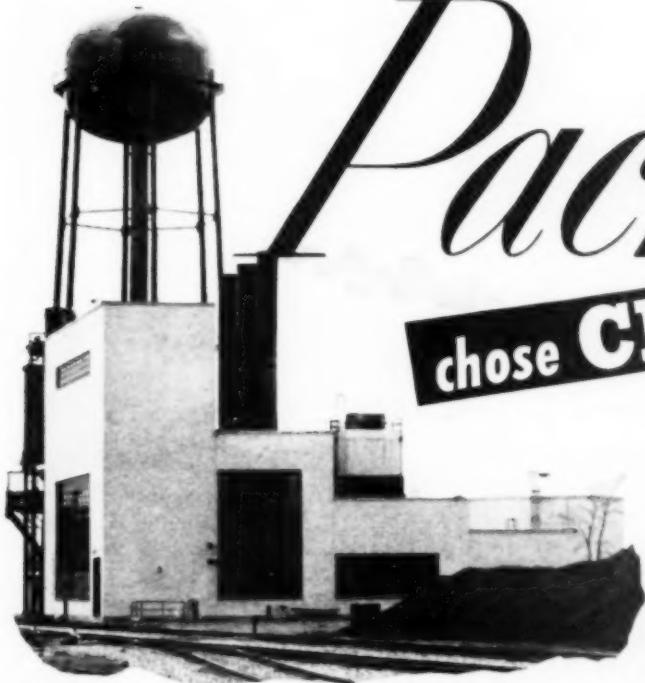
Milwaukee 1, Wisconsin



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Volume 71

Number 10



# Packard

## chose CLARAGE

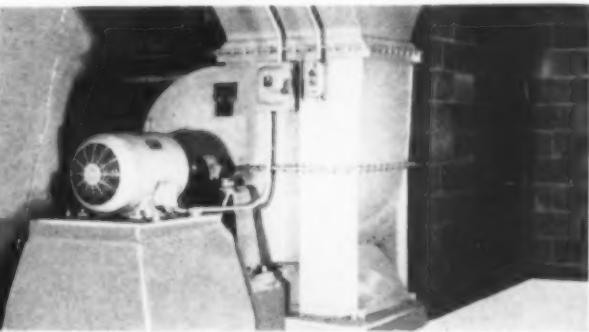
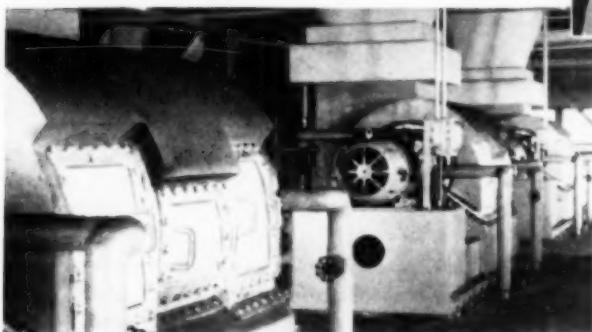
This is the new Packard Motor Car Company power plant in Utica, Michigan—expertly designed to generate steam at lowest cost.

Packard installed Clarge heavy-duty draft fans — a very wise decision!

... for as the years go by, Clarge fans will pay off time and time again — meeting varying load demands exactly, operating more economically, giving round-the-clock service with an extraordinary freedom from maintenance and repairs.

### 3 FORCED DRAFT FANS

OPERATING DATA: — Each forced draft fan (equipped with Clarge Vortex capacity control) has a certified rating of 11,000 c.f.m. of standard air at 3" static pressure when operating at 1160 r.p.m.



### 3 INDUCED DRAFT FANS

OPERATING DATA: — Each induced draft fan (equipped with Clarge water-cooled bearings) has a certified rating of 18,000 c.f.m. of flue gases at a temperature of 560° F. when operating at 1160 r.p.m.

Want to know the secret of the superior performance you get from Clarge fans? Then write for the Clarge Service Manual — which tells all! 78 pages of valuable information on your BEST BUY in air handling and conditioning equipment. Clarge Fan Company, Kalamazoo, Michigan.



You can Rely on...

# CLARAGE

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

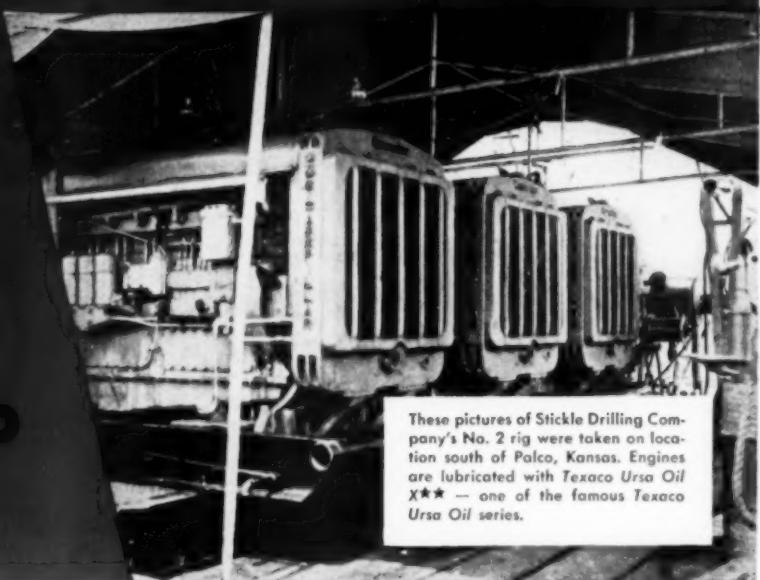


Headquarters for  
Air Handling and  
Conditioning Equipment



# 28,540 HOURS' OPERATION... WEAR LESS THAN .001"

**Stickle  
Drilling  
Company's  
Diesels are  
lubricated  
with TEXACO  
URSA OIL**



These pictures of Stickle Drilling Company's No. 2 rig were taken on location south of Palco, Kansas. Engines are lubricated with Texaco Ursa Oil X★ — one of the famous Texaco Ursa Oil series.

Stickle Drilling Company, Tulsa, Oklahoma, has long been getting outstanding performance from Diesels lubricated with *Texaco Ursa Oil*. Typical are the three Caterpillar Diesels operating the No. 2 drilling rig. These were taken down for inspection after 28,540 hours of operation, and the following report gives the story:

"We found that *Texaco Ursa Oil* had kept these engines ideally clean. Measured wear was under one-thousandth of an inch. Since then, the engines have been back in operation for over 10,000 additional hours without any down time."

You can get similar fine performance by using the rec-

ommended member of the famous *Texaco Ursa Oil* series — a complete line of lubricating oils for Diesel, gas and dual-fuel engines. Whatever the type, size or speed of your engines, their operating conditions or fuel used, there is a *Texaco Ursa Oil* to assure clean, efficient performance with minimum maintenance costs and fuel consumption. The *Texaco Ursa Oil* series is approved by leading engine builders and preferred by operators everywhere.

A *Texaco Lubrication Engineer* will gladly give you full information. Just call the nearest of the more than 2,000 *Texaco Distributing Plants* in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



## TEXACO URSA OILS

FOR ALL DIESEL, GAS AND DUAL-FUEL ENGINES

# SOUTHERN POWER AND INDUSTRY

Vol. 71  
No. 10

OCTOBER  
1953

NBP



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# Facts and Trends

## FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

October, 1953

- SEVERAL POWER "FIRSTS" have been established by Appalachian Electric Power Company's Kanawha River Plant located in the Kanawha Valley chemical area near Charleston, West Virginia. Semi-technical description will be featured in the December issue of SP&I.

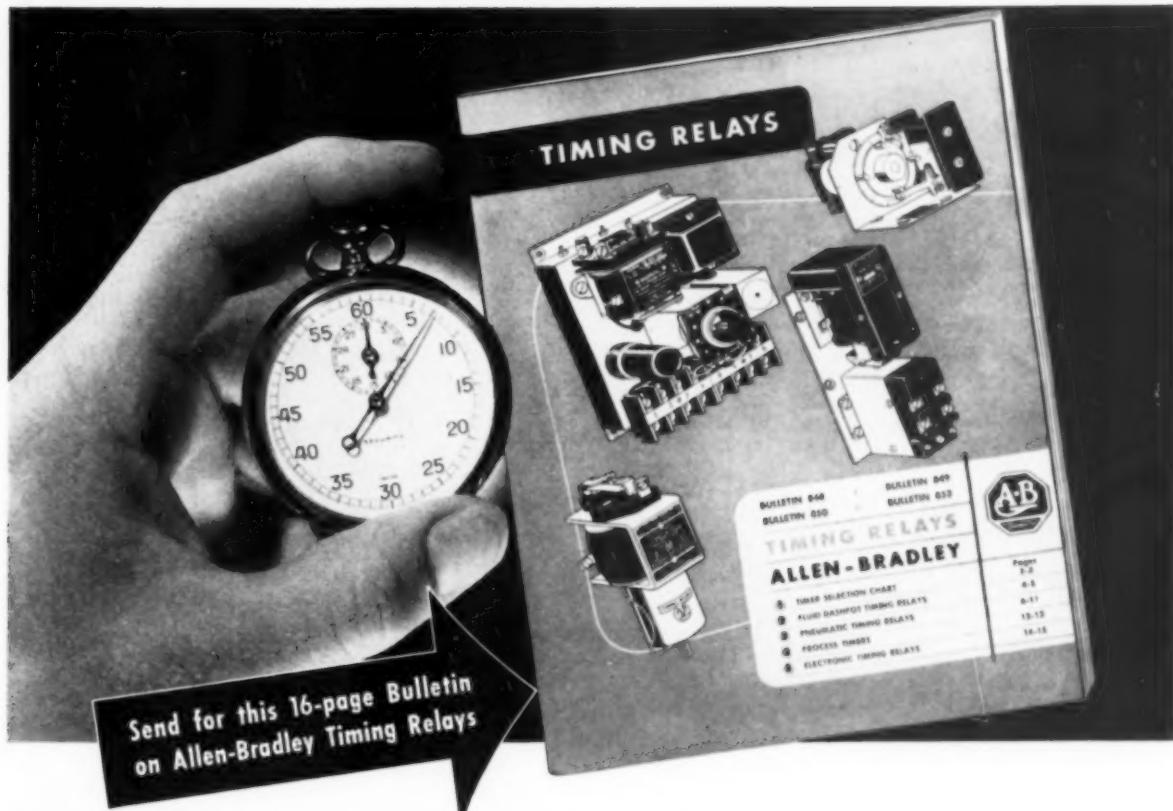
With two initial units of 200,000 kw capacity each, plant design features include the largest generating units of this type, and the largest boilers ever built, serving the highest voltage (330,000 volt) transmission line in this country. High pressure turbine operates at initial steam pressure of 2100 psi and 1050 F. Generator voltage is 18,000.

Thermal economies, hitherto unattained, will result in a heat rate of 9000 Btu per net kwh. Large size of units and compact design results in the extremely low building volume of 19.3 cu ft per kw, including all service and office facilities, and with all equipment housed except precipitators, fans and heaters.
- GOT A WET PROCESSING OPERATION where you need a check on moisture content? Need to check the degree of caustic or acid concentration in materials being processed? Strandberg Engineering Laboratories' Moisture Monitor, an accepted instrument for indicating moisture condition of textile warps and fabrics in production, may prove its worth in other industries.

Several Carolina textile mills using the monitor on slashers report that steam consumption for drying purposes can be substantially reduced and machine speeds increased.
- FIVE ADDITIONAL ALUMINUM ALLOYS are listed for the first time in the latest ASME Boiler and Pressure Vessel Code. Alloy specifications have been included for bars, rods and shapes, bolting materials, pipe, tube and forgings. It is expected that aluminum alloys will result in new operational and initial cost savings in pressure vessel applications.
- WHO SPILLED THE N,N'2(12-hydroxy-9-octadecenoxylamidoethyl) ethylenediamine? National Aluminate asks the question and then puts it another way: Who Spilled the Nalco Antifoam? It is one of several Nalco antifoams that are widely used, not only in boilers but wherever foaming liquids are a problem.

The initial question shows you that the language of the water treating industry could be confusing. Translation to common terms plus unconfusing recommendations is one of the jobs performed by engineers representing this important field.
- ALL-ALUMINUM CONTROL CENTERS--65% lighter than their steel and copper counterparts--are especially applicable to the food producing and chemical industries where cleanliness and neatness is paramount and corrosive atmospheres a problem. Individual units of the Westinghouse design are removed easily: 90 degree turn on two quick fasteners is all that is necessary.

(Continued on page 6)



Send for this 16-page Bulletin  
on Allen-Bradley Timing Relays

## FOUR POPULAR TIMERS • SIMPLE AND DEPENDABLE

### PNEUMATIC



Bulletin 849 pneumatic timing relay is a long life timer of high repetitive accuracy. Has an adjustable pneumatic bellows for regulating the tripping time. Time delay minimum  $\frac{1}{4}$  second, maximum 3 minutes. The operation of this pneumatic timer is easily changed from "on delay" to "off delay." A reliable, compact timer that is available in a wide variety of contact arrangements. It can be furnished in open type or in enclosures of various NEMA types of construction.

### FLUID DASHPOT



Bulletin 848 fluid dashpot timing relay is a low cost, adjustable timer for applications not requiring a high degree of accuracy, such as for timing electrically operated valves, motor starting sequences, etc. Time delay minimum 2 seconds, maximum 30 seconds. Single pole contacts, either normally open or normally closed. Silicone dashpot fluid assures consistent action at low ambient temperatures. Furnished in open type, as illustrated above, for panel mounting, or in pressed steel and cast iron enclosures for every service.

### MOTOR DRIVEN



Bulletin 850 Style L motor driven timer is a precision switch of the maintained contact type. It alternately opens and closes two switch units 2, 3, 4, or 6 reversals per min. Ideal for controlling reversible machinery such as laundry washers or other processing equipment. Run and drift time easily adjusted. Silver alloy contacts.

### ELECTRONIC



Bulletin 852 Electronic Timer has a thyratron tube used as a combination a-c rectifier and electronic switch. In 8 timing ranges from 0.025 sec. to 2 min. Accuracy 2% of setting. Ideal for machine tools, high frequency heating equipment, and photographic printing.

STANDARD  
ENCLOSURES  
FOR EVERY SERVICE



NEMA Type 1



NEMA Type 4



NEMA Type 7

Allen Bradley Co.  
1328 S. Second St., Milwaukee 4, Wis.

# ALLEN-BRADLEY SOLENOID MOTOR CONTROL

CONSULT YOUR LOCAL ALLEN-BRADLEY REPRESENTATIVE

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## **facts and trends (continued from page 4)**

- GOING TO INVEST IN DUAL FUEL TO UTILIZE GAS? It's no longer necessary according to The Webster Engineering Company. They say to just add the gas with Webster's Rectilinear Gas Burner. The packaged unit makes four inches pressure do the work of four pounds with fractional horsepower.

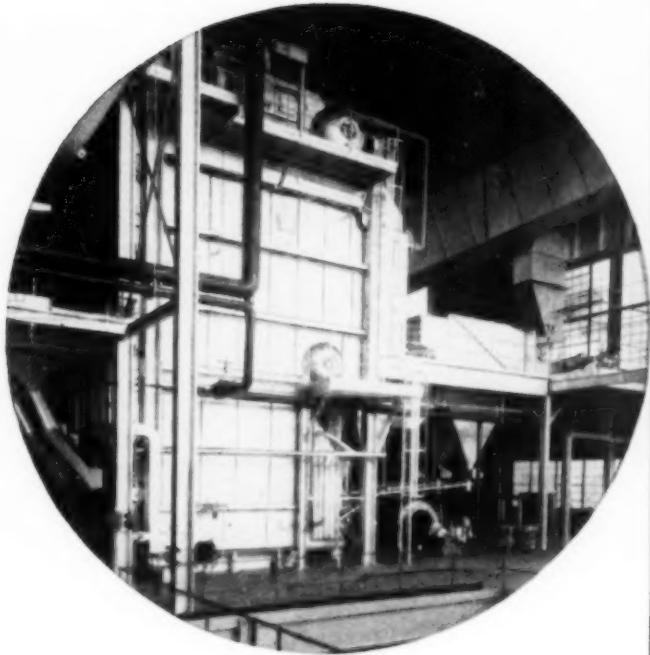
You can fire gas--automatically--through any narrow opening without disturbing your present firing equipment--hand or stoker fired coal, oil or whatever it may be.
- CARBON BLACK is being turned out at the record-breaking rate of 5 1/2 lb per 1000 cu ft of natural gas (about 3/4 lb is standard) in a pilot plant built by Rice P. Lynn of San Angelo, Texas. Secret of the high recovery is the collection of fine particles by electrostatic means. The inventor estimates a full-scale plant would cost only a fraction as much as a conventional plant.
- EVER SEE A STUTZ "BEARCAT" on the road these days? With a knack for tinkering hobbyists still keep a few going. They are good cars, but hardly economical modern transportation. Now consider how much antique wiring lies around still doing a job . . . of sorts. Hardly efficient. Pathetically unprofitable when pitted against modern power needs. What are we going to do about it?
- Anaconda's WIRE AHEAD and POWER UP campaign posed the question and is contributing to the electrical industry's counterattack against obsolescent wiring. The company emphasizes that lower operating costs from more efficient power distribution influence plant profits. Re-evaluate your plant's wiring . . . it's a timely undertaking.
- EDGES OF UNDERGROUND CONVEYOR BELTS receive extremely severe punishment in coal mining service. Often belt edges will wear through the rubber cover to the inner belt fabric. Then moisture and coal particles enter the fabric and cause rapid belt deterioration. United States Rubber Co. is adding a tough rubber capping along the edges to give longer service life.
- THEY CALL IT THE BLO-HOG and it eats up everything--pine, oak, gum, hickory, elm, wet veneer, sandy bark, cores, timbers and slabs. It will even consume wire, nails, screws, or steel plate 1/8 in. thick, without any damage to the machine.
- Jacksonville Blow Pipe's development has opened up a new field for a great many wood-working plants. Now they can convert nuisance scrap into profitable items. One of its big economical advantages is that when fed by conveyor, it does not require an attendant.
- A CONVINCING DEMONSTRATION of the economy of using durable material is a pipe repair job where low first cost material has failed and is being replaced. The original job had been quickly made by plumbers. But the replacement calls for hours of work by as many as five crafts: plumber, mason, plasterer, carpenter, and painter. Production slow-down, disrupted routine may amount to far more than the maintenance charges.

The A. M. Byers Company says the answer to pipe durability in corrosive services is wrought iron pipe; emphasizes that corrosion costs you more than wrought iron; and reminds the plant engineer that it takes only ONE to install pipe . . . but FIVE to repair it.

---

Write the editors for additional information on any of the above items.  
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

# City of Manitowoc installs fifth WICKES steam generator



R. E. Connard — Chief Engineer and General Manager

To provide a dependable source of power for the City of Manitowoc, Wisconsin, the Manitowoc Public Utilities Commission has just installed a fifth WICKES Steam Generator capable of producing 175,000 lbs. of steam per hour at 525 psi. Final steam temperature is 750°F. The new WICKES Boiler has 11,600 sq. ft. of heating surface. It is equipped with an economizer and fired by spreader stoker.



WICKES can fill your requirements for all types of multiple drum boilers generating up to 250,000 lbs. steam per hour at pressures up to 1000 psi. adaptable to any standard method of firing — oil, gas, single retort underfeed or spreader stoker. For pressures up to 900 psi. with sustained steam production up to 35,000 lbs. WICKES Type A Boilers can be shop assembled, ready for immediate installation. Write today for descriptive literature or consult your nearest WICKES representative.



THE WICKES BOILER CO., SAGINAW, MICHIGAN RECOGNIZED QUALITY SINCE 1854  
DIVISION OF THE WICKES CORPORATION

SALES OFFICES: Albuquerque, N. M. • Atlanta • Boston • Charlotte, N. C. • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Wayne, Ind. • Greensboro, N. C. • Houston • Indianapolis • Los Angeles • Memphis • Milwaukee • New York City • Orangeburgh, S. C. • Pittsburgh • Portland, Ore. • Saginaw • Salt Lake City • San Francisco • Springfield, Ill. • Tampa, Fla. • Tulsa • Washington, D. C.

150



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**SAFELY**

• with •  
**KERRIGAN**  
***Weldforged***

Stair Treads

Kerrigan anti-slip steel grating and stair treads, Weldforged into strong, INSEPARABLE units (Bonderized for rust resistance) afford maximum light and ventilation plus minimum maintenance through long years of trouble-free use.

Write for catalog and specification sheets and a FREE copy of the interesting booklet, "A Picture Story of KERRIGAN."

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NASHVILLE, TENNESSEE

GENERAL SALES OFFICE: 274 MADISON AVE., NEW YORK CITY



# Equipment..Supplies..Methods

## for the plant engineer and operating force

### Electric Impact Wrench

J-1 SNAP-ON TOOLS CORPORATION, Kenosha, Wisconsin, announces the availability of a new  $\frac{1}{2}$  in. square drive electric impact wrench, which can be used with a variety of sockets and attachments.

Series of nuts can be removed or installed in a fraction of the time needed for standard hand tools and with no effort or fatigue on the part of the operator. The tool can also be used for driving gear pullers, stud removers, all types of screw driver bits, hole saws, structural reamers, and steel, wood, or mortar bits.



Snap-on Tools Corporation's new  $\frac{1}{2}$  in. square drive electric impact wrench. After a certain torque is reached, rotary action of the heavy duty motor is transferred through impact mechanism to sharp, powerful blows at the drive spindle. Blows become heavier as the torque increases, thus, the larger the nut, the heavier turning impact it receives.

It delivers up to 2000 powerful rotary blows per minute, and as there is no direct connection, the motor runs continuously—it cannot be stalled or burned out because of overload. None of the torque is transmitted to the operator, which allows easy one-hand operation under all working conditions.

Forward or reverse action with or without the motor running is obtained by twisting the end cap, and the positions are clearly indicated.

*Free additional information is available to readers of SP&I. Circle the item code number on one of the reader service post cards provided on pages 17-18.*

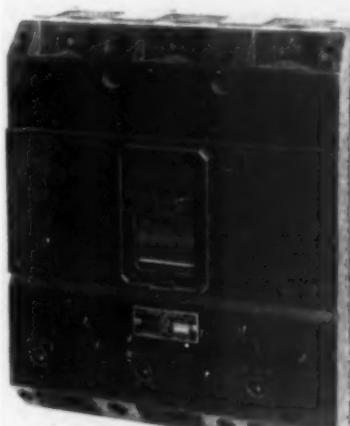
### Circuit Breaker Design

J-2 THE I-T-E CIRCUIT BREAKER Co., 19th and Hamilton Sts., Philadelphia 30, Pa., has introduced the new I-T-E "J" frame circuit breaker which is more compact than former 225-ampere design—without sacrificing any protective features. Measuring only 9 in. wide by 11 in. in length and  $5\frac{1}{2}$  in. deep (including handle), the new "J" frame saves space in switchboards, distribution-type panel-boards, power panels, bus plugs, combination motor starters, and individual enclosures. This reduced size allows "Double-but" mounting in convertible panel-boards.

New design features include enclosed terminals that provide added safety and reduce the possibility of

phase-to-phase faults. External instantaneous trip adjustment provides 5 separate instantaneous trip-point settings. Solderless pressure-type cable connectors allow quick and easy cable connection. Rear connection studs simplify switchboard mounting.

The new "J" frame is a thermal-magnetic circuit breaker with quick-make, quick-break operating mechanism. Common trip operation is retained; an overcurrent on any pole opens all poles simultaneously.



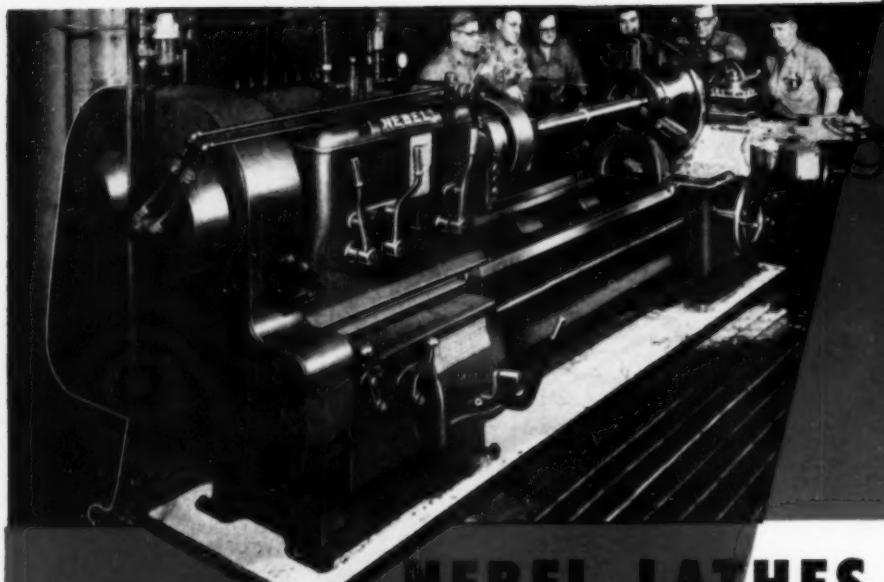
New I-T-E is available in ratings from 70-225 amperes; 2- and 3-pole; 600 v. a-c; 250 v. d-c; 15,000 amperes interrupting.



### Chain Cutter

J-3 H. K. PORTER, INC., 74 Foley St., Somerville, Mass., has developed a chain cutter with tripod and ratchet chain attachment which more than doubles the pressure one man can apply.

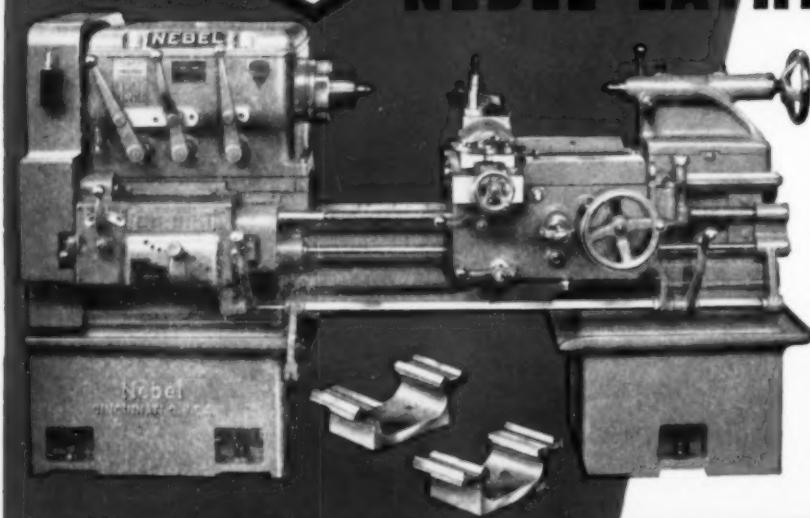
The 40 lb portable cutter handles chain up to  $\frac{1}{2}$  in. of 300 Brinell or  
*(Continued on page 138)*



## Big 36" Nebel 'F' series

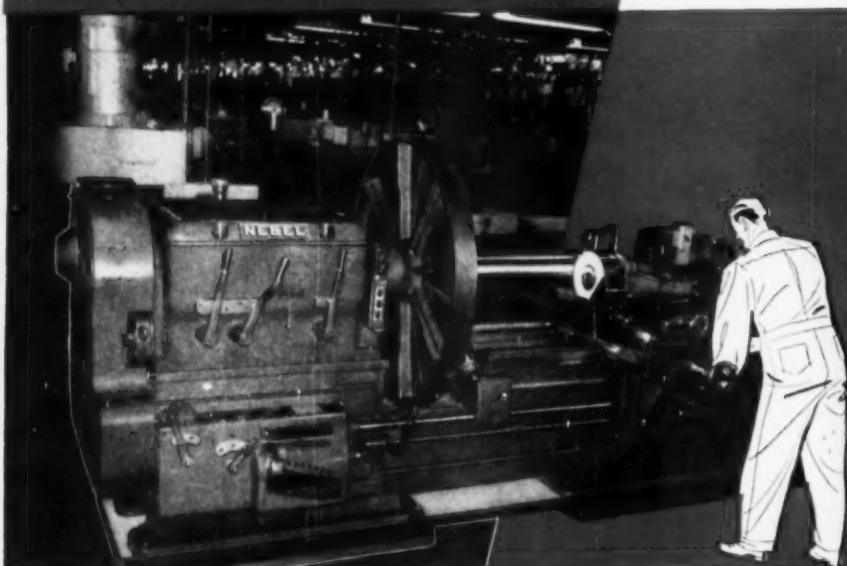
engine lathe turning large jet engine turbine wheel and shaft at Packard Motor Car Co. Other Nebel engine lathes available in swing sizes ranging from 16" to 32".

## NEBEL LATHES GIVE YOU...



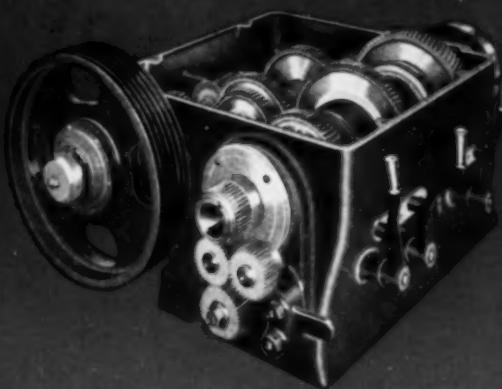
## 16"/27" Nebel 'LA' series

removable block gap lathe provides extra swing capacity when required. 20"/30" and 25"/40" models also available.



## 28"/50" Nebel 'G' series

extension bed gap lathe . . . like this one on the job at Eastern Air Lines . . . provides flexible swing and center distance capacity . . . actually performs the work of two ordinary lathes. Also made in 20"/40" size.



## Headstock Powerhouse Timken-Equipped

Headstock gears are husky, wide-faced and all are shaved and hardened. Helical drive gears assure smooth, quiet drive. Spindle rolls effortlessly on Timken anti-friction bearings. Spindle speeds obtained through sliding gear combinations and large multiple tooth clutch. A new dynamic brake motor—that stops spindle instantly—is available at additional charge.

# ...PERFORMANCE WITHOUT PREMIUM

You pay less for Nebel lathes because they're *basic*. They're not loaded with a lot of expensive 'extras' you may never need. And yet they offer the capacity, power and speed you need for most metal turning. Attachments and accessories are available to round out special, individual requirements.

Nebel lathes are built in three styles: engine lathes, 16", 20", 25", 27", 32" and 36" swing sizes . . . removable block gap lathes, 16"/27", 20"/30" and 25"/40" swing sizes . . . extension bed gap lathes, 20"/40" and 28"/50" swing sizes.

Nebel design, construction and operating advantages assure the performance you want. The powerful geared headstock with shaved and hardened gears and Timken anti-friction bearings . . . the unusually long carriage . . . the quick change gear box and double-walled apron with hardened gears . . . are but a few of the reasons why Nebel lathes are so well received by industry.

Buy Nebel for production or maintenance. Either way you'll soon find they're the most useful and the most frequently used lathes in your shop. For complete information, write today for descriptive bulletins.

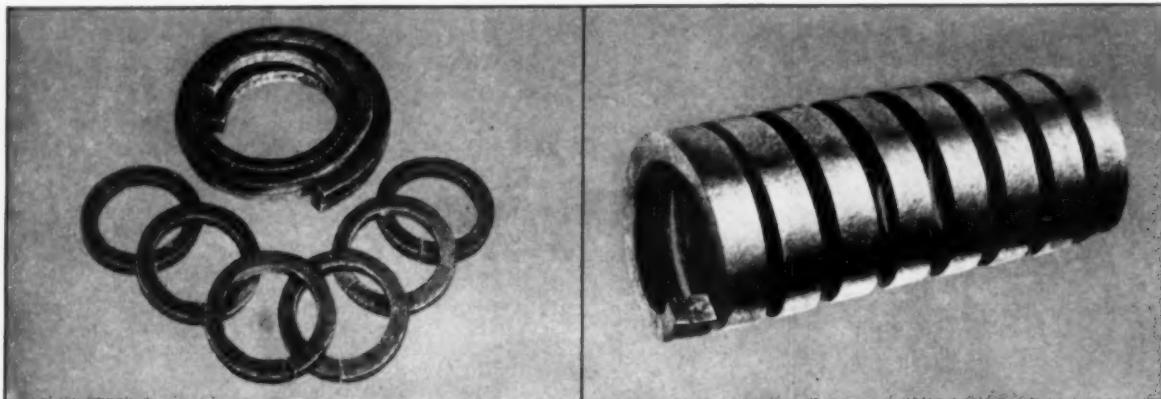


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The Nebel carriage is unusually long and is carefully hand scraped to the two bed ways. Takes the full thrust of the cutting tool without budging.

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**Type 1: R/M Universal Plastic Packing and "versi-pak."**® In Universal Plastic Packing, R/M has combined asbestos fiber and graphite with lubricant and binder. 1840-A is a basic universal packing. In 1840-C the binder has been varied so that the material is highly oil resistant. In 1840-D mica is used instead of graphite so that the packing will be sanitary for food processing equipment.

These packings are recommended for circulating, reciprocating and centrifugal pumps, including boiler feed pumps.

In "versi-pak" (No. 1845) the combination of ingredients has been slightly changed and a special solvent proof binder is used. This packing is recommended for rotary solvent installations and reciprocating solvent pumps up to 350° F. and/or 600 psi pressure.



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RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Teflon Products  
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Subsidiary of ROCKWELL MANUFACTURING COMPANY  
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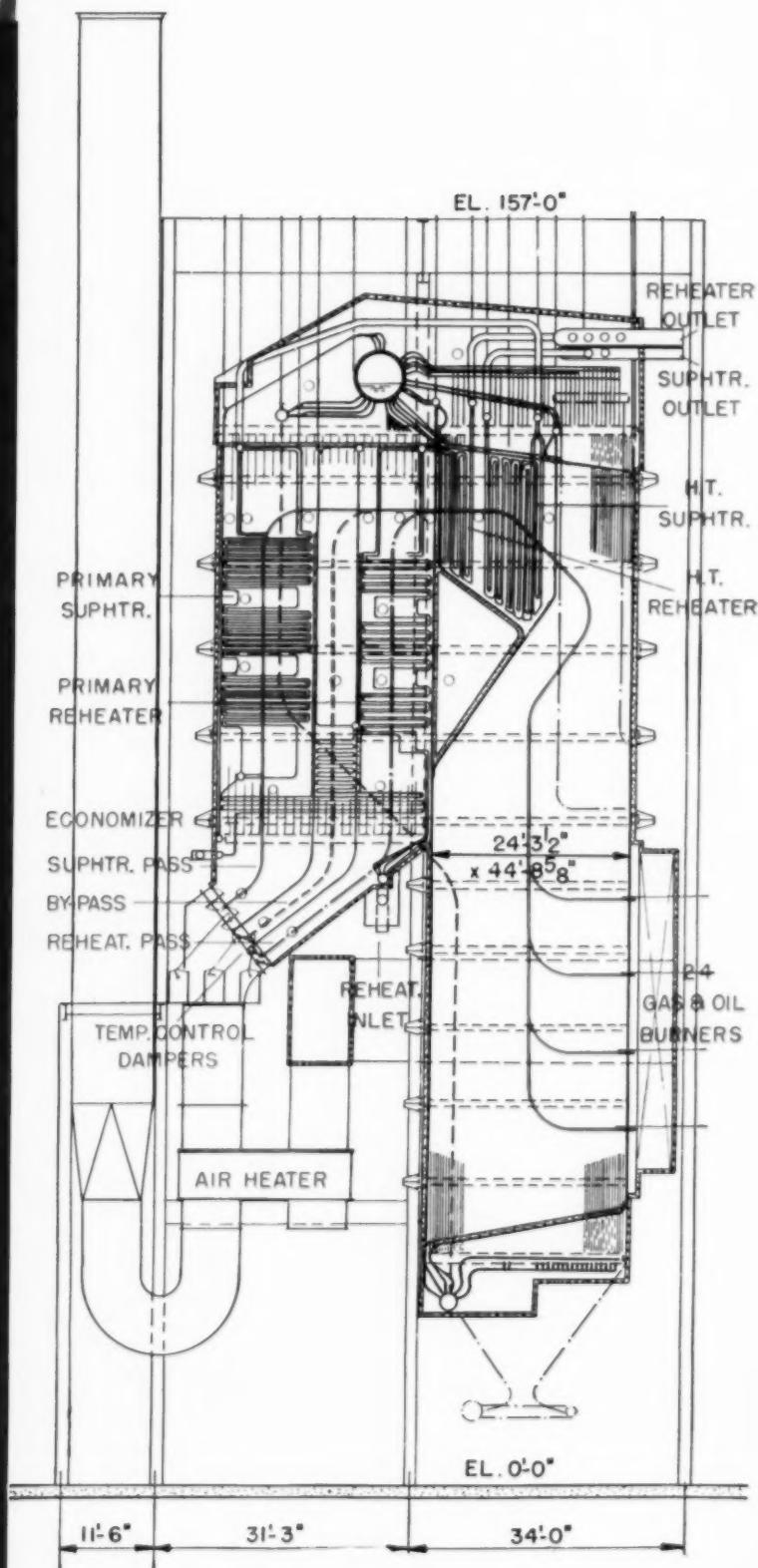

**TYPICAL  
RILEY  
1,250,000 lbs./hr.  
REHEAT UNIT**

Capacity—1,250,000 lbs./hr.  
Design Pressure—2125 psig.  
Superheater Outlet Pressure—  
1925 psig.  
Steam Temperature—1005°F.  
Reheater Capacity—1,148,000  
lbs./hr.  
Reheater Outlet Pressure—470  
psig.  
Reheater Temperature—1005°F.  
Efficiency Gas Firing—83.7%  
Pressurized Furnace  
Fired by Gas. Oil Standby  
Designed for future conversion  
to Lignite firing.

**AUTOMATIC  
STEAM & REHEAT  
TEMPERATURE  
CONTROL**

This typical Riley Reheat installation utilizes gas by-pass dampers located in a low-temperature area beneath the Economizer to automatically proportion the gas flows over the Superheater and Reheater primary surfaces. Steam temperatures and reheater temperatures are maintained constant at 1005° Fahrenheit over a wide load range. At high loads, if required to maintain desired temperatures, part of the gases can be by-passed through the open lane between Reheater and Superheater primary surfaces. Note extra Economizer surfaces in the By-Pass line. This arrangement provides for approximate uniform exit gases.

You, too, can rely on Riley experience and know-how when considering steam generation and fuel burning equipment.



# These large Public Utility Companies have ordered RILEY Reheat Units *with steam capacities as high as 1,250,000 pounds per hour!*

## ● HOUSTON LIGHTING & POWER CO.

1,250,000 lbs./hr.  
2075 psig. 1005°F.  
1005° Reheat

## ● DEPT. OF WATER & POWER

City of Los Angeles, Cal.  
1,200,000 lbs./hr.  
2075 psig. 1000°F.  
1000° Reheat

## ● TEXAS ELECTRIC SERVICE CO.

1,250,000 lbs./hr.  
2075 psig. 1005°F.  
1005° Reheat

## ● LOUISIANA POWER & LIGHT CO.

1,000,000 lbs./hr.  
1725 psig. 1005°F.  
1005° Reheat

## ● PUBLIC SERVICE CO. OF INDIANA

884,000 lbs./hr.  
2050 psig. 1005°F.  
1005° Reheat

## ● UTAH POWER & LIGHT CO.

575,000 lbs./hr.  
1700 psig. 1000°F.  
1000° Reheat

These are but a few of the big Riley installations that are being ordered by power companies in State after State across the country. The Houston Lighting & Power Company, one of the large Southwest public utilities, has recently ordered two of the big 1,250,000 pounds per hour Riley Reheat Units. These will be their tenth and eleventh Riley units, nine others having been installed during the past fifteen years. These Riley units will

increase the Houston Company's steam capacity to over 7,000,000 pounds per hour. Both the Texas Electric Service Company and the Dallas Power & Light Company will also increase their power generating facilities with similar units of 1,250,000 pounds per hour capacity . . . conclusive evidence that Riley enjoys the confidence of increasing numbers of big, expansion-minded power companies.



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STOKER CORPORATION

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WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • AIR HEATERS

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*And How to Do It*

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SOUTHERN POWER AND INDUSTRY

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10-53-1

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190	205	223	224	240	272	279	300	304	315	320	331	356	369	374	396	397
406	409	414	435	443	471	473	480	497	498	502	503	535	575	578	600	605
611	623	672	693	731	747	755	758	790	807	808	831	833	846	858	861	901
904	906	956	961	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13
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10-51-2

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611	623	672	693	731	747	755	758	790	807	808	831	833	846	858	861	901
904	906	956	961	VI	V2	V3	V4	V5	V6	V7	V8	V9	V10	VII	V12	V13
VI4	V15	V16														

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**861 FUSETRON FUSES**—Booklet—Gives complete facts on Fusetron dual-element fuses, a combination fuse and thermal cut-out of low electrical resistance and high time lag—prevents shut-downs, saves maintenance costs.—BUSSMANN MFG. CO.

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BUILDING EQUIPMENT, METALS**

**901 CENTRIFUGAL BLOWERS AND EXHAUSTERS**—Bulletin A-650, 18 pages, describes the design features and the applications of Hoffman multi-stage centrifugal blowers. Capacity tables, work data and handy information included.—U. S. HOFFMAN MACHINERY CORP.

**904 STEEL GRATING AND STAIR THREADS**—12 page catalog—Shows "Weldforged" steel construction and application—spiral crossbars, alternating right and left and slightly above bearing bars, electrically weldforged into one unit to insure greater non-skid protection and durability.—KERRIGAN IRON WORKS, INC.

**906 INDUSTRIAL DUST COLLECTOR**—Catalog 101—Describes the Aerco industrial dust collector, available in self-contained, custom-built industrial assemblies which may be adapted as integral parts of existing equipment, with tube performance records given on eight representative dusts.—THERMIX ENGINEERING CO.

**956 SWIMMING POOL EQUIPMENT**—Bulletin WC-109—Describes a complete line of swimming pool equipment, including filters, chemical feeders, sterilizers, hair and lint catchers, pool cleaners, recirculating pumps, heaters, fittings and accessories—dimension, capacity and other tables.—GRAVER WATER CONDITIONING COMPANY.

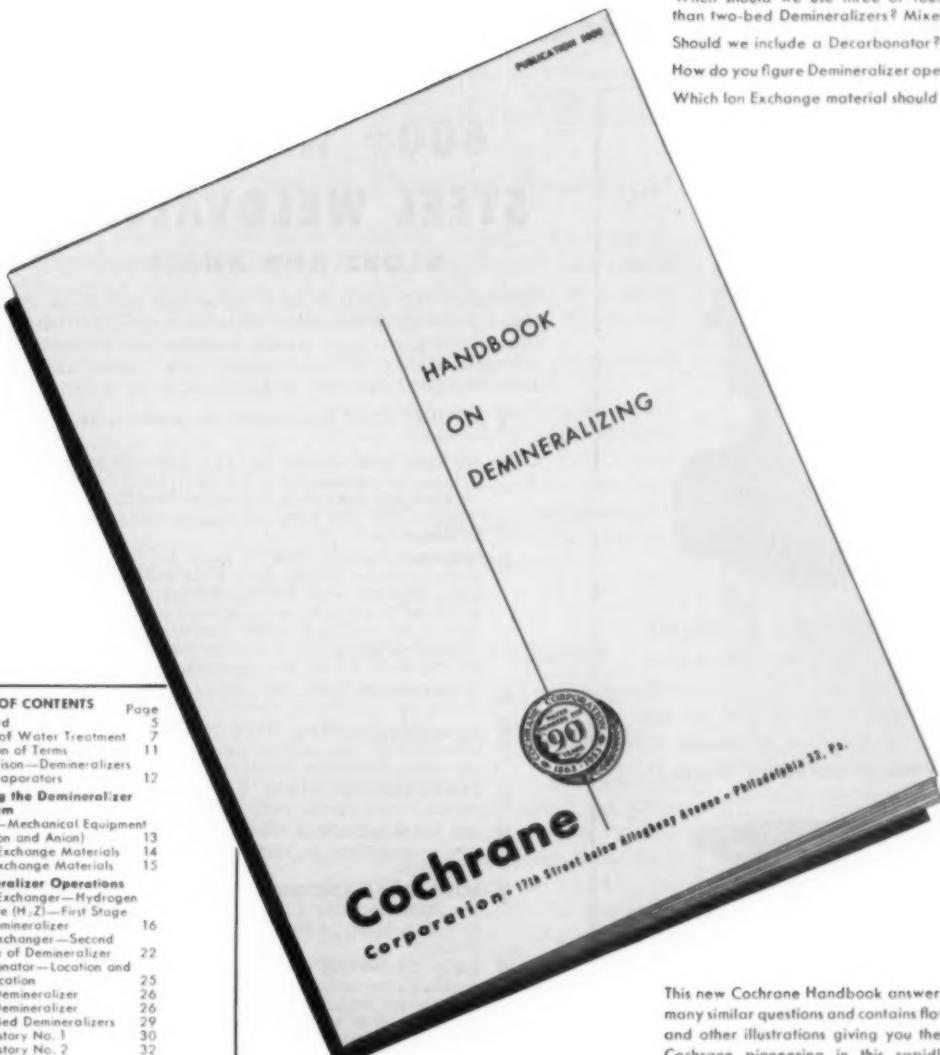
**961 ENGINEERING SERVICES**—Catalog 0.94.002—Including special equipment section, describes qualifications for designing, engineering and construction of plant and processing facilities for Petroleum, Natural Gas and Power industries.—J. F. PRITCHARD & CO.

Continued on page 177

**List Items You Want,  
Tear Out and Mail  
One of the  
Attached Cards  
Now!**

Please be sure to fill in your Firm's Name and your position on the Coupon. This service cannot be extended to you unless this information is furnished.

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Why is Deminerlization being selected instead of Evaporators?

When should we use three or four-bed rather than two-bed Deminerlizers? Mixed Bed?

Should we include a Decarbonator?

How do you figure Deminerlizer operating costs?

Which Ion Exchange material should we specify?

This new Cochrane Handbook answers these and many similar questions and contains flow diagrams and other illustrations giving you the benefit of Cochrane pioneering in this rapidly growing field. Request a copy on your letterhead.

# cochrane

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Hot Process Softeners • Deaerators • Dealkalizers • Deminerlizers • Reactors • Continuous Blow-Off • Specialties • C-B Systems

# 10 FACTS YOU SHOULD KNOW



**600# HANCOCK STEEL WELDVALVES**, in globe and angle types, are built for all pressures up to 850 psi at 750°F—O.W.G. 2000\*, 100°F. Screwed and socket weld ends available on sizes from  $\frac{1}{4}$ " through 2". Flanged ends on sizes from  $\frac{1}{2}$ " through 2".



YOUR INDUSTRIAL SUPPLY DISTRIBUTOR has the facilities and experience to serve you efficiently and economically. He banks his reputation on the quality of the products he sells. You can depend on him for sound recommendations and prompt deliveries from local stocks.

## HANCOCK VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** Watertown 72, Massachusetts



MAKERS OF 'HANCOCK' VALVES, 'ASHCROFT' GAUGES, 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, AIRCRAFT PRODUCTS. BUILDERS OF "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

# HALL INDUSTRIAL WATER REPORT

Hall Laboratories, Inc.—A Subsidiary of Hagan Corporation, Pittsburgh, Pa.

Volume 1

OCTOBER 1953

Number 5

## Expert Knowledge Solves Process Problems

A hurry-up call from a Hall field engineer sent C. T. Roland, Pittsburgh headquarters expert on metal preparation and paint finishing to confer with a west coast automobile plant on a paint blistering problem. The sudden occurrence of the blistering baffled the plant engineers until Roland investigated the possibility of a change in the source of the water used in final rinsing of the metal before paint was applied. He found that the quality of the water supply had changed shortly before the blistering developed. Analysis showed that this supply was higher in pH and dissolved solids, particularly sodium chloride, than the water previously used. Mr. Roland's experience in dealing with the action of soluble salts under paint films led to the conclusion that in this case the paint was acting as a semi-permeable membrane, allowing the passage of moisture from the outside surface of the paint to the salty underlayers. Blisters formed wherever the osmotic pressure of the salt solution exceeded the bond of the paint to the metal. The higher alkalinity of the water contributed to the loss of adhesion, promoting further separation of the finish from the metal.

With the cause for the trouble established, recommendations were made to obtain a water supply low in solids until the plant could install equipment to insure the constant delivery of water of suitable quality for this operation.

In another case where specialized knowledge was useful, Ralph Thompson, specialist on paper manufacturing processes, was called in to help a paper mill out of a jam. Their calender rolls, the polished steel rolls that "iron" paper smooth, were corroding. Regrinding to polish the rolls was costly.

Mr. Thompson's on-the-spot investigation revealed that too much alum was being used in the sizing. Alum feed was reduced and the process water was treated with a glassy phosphate corrosion inhibitor. When reliable controls of the modified process were set up, corrosion disappeared.

## Water Well Capacity Increased by Treatment With Glassy Phosphate

Initial capacity of new municipal well was recently increased 63% by treatment with Calgon.\* Other new wells in the field developed capacity increases up to 34%. In an old well where the capacity had fallen to only 9.5 gallons per minute per foot of drawdown, one charge of Calgon raised the capacity to 31.2 gallons per minute per foot of drawdown, an increase of 228%.

In another case, after acid cleaning had restored a municipal well to approximately the same capacity it had when new, a single charge of Calgon raised the capacity by 100%, or about twice the original capacity of the well.

The dispersive action of glassy phosphate is responsible for its efficiency as a well cleaner. Cleaning with inhibited acid removes deposits of calcium carbonate and iron oxide, but will not affect accumulations of clay, quartz, amorphous silica, mica or silt. These latter are also dispersed and removed by Calgon cleaning.

## Hall Is Water Consultant For Asia's Greatest Power Station

India's \$35 million power plant, 200 miles north of Calcutta in the Damodar Valley, began operation in February. This is part of an



Alex Henricks, staff engineer serving as consultant for India's new power plant, lifts water sample from container marked "This Package Opened and Examined by Customs at Calcutta."

extensive project to hasten the industrial development of a  $\frac{1}{4}$ -million square mile area of India.

Engineers and constructors of the station, The Kuljian Engineering Corporation of Philadelphia, have retained Hall Laboratories, Inc. as water consultants.

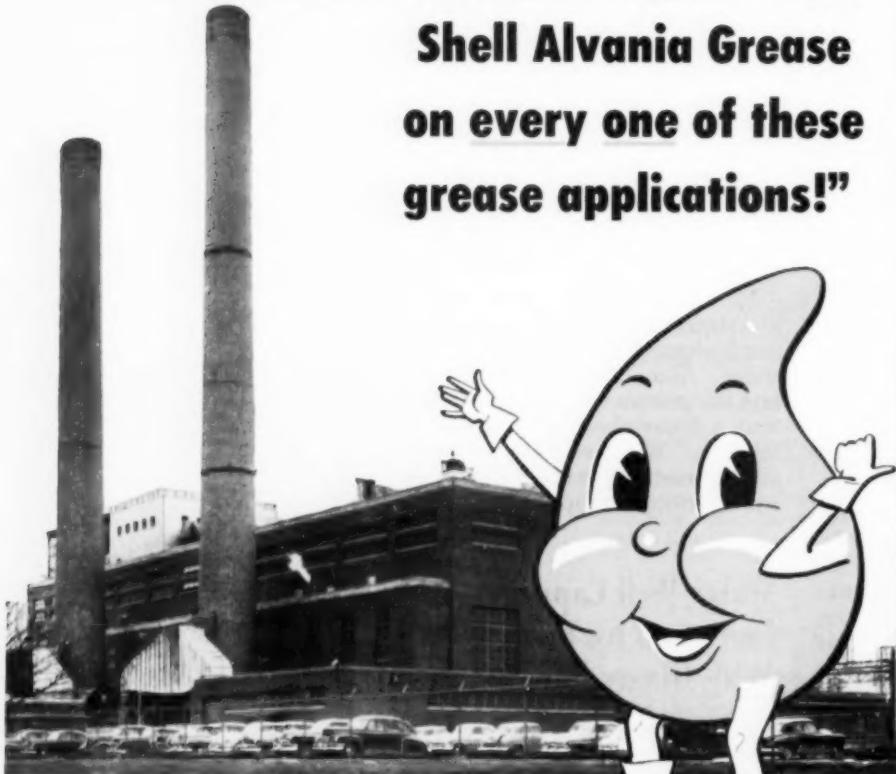
## Industrial Water Problems Require Special Handling

There are no "stock answers" to industrial water problems. For information, write, wire or call Hall Laboratories, Inc., Hagan Building, Pittsburgh 30, Pa.

*Water is your industry's most important raw material. Don't waste it.*

\*Calgon is a registered trademark.

**"Indianapolis Power & Light Company's  
large new White River plant uses  
Shell Alvania Grease  
on every one of these  
grease applications!"**



**Check the multiple qualities  
of this remarkable lubricant**

Shell Alvania Grease is effecting important improvements in plant maintenance and purchasing practice. In plant after plant, this one grease is replacing the many special purpose greases formerly used . . . for *every grease application in the plant!*

**Look at these advantages:**

**1. Shell Alvania Grease flows freely** in cold temperatures, yet will

not run out of bearings under excessive heat.

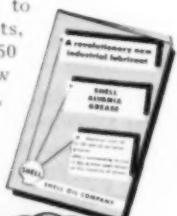
**2. Ideal for wet**, humid applications . . . it resists water emulsification.

**3. Shell Alvania Grease has** extremely high oxidation stability.

**4. You'll find that** Shell Alvania Grease extends time between greasings . . . a substantial saving in labor and grease.

**5. Simple inventory . . . just the one grease to stock and apply.**

The economy of handling just one grease instead of *many* is an established fact. Write for the new booklet on Shell Alvania Grease . . . to Industrial Lubricants, Shell Oil Company, 50 West 50th Street, New York 20, N. Y.—or, 100 Bush Street, San Francisco 6, Calif.



**SHELL ALVANIA GREASE**  
*The True Multi-Purpose Industrial Grease*

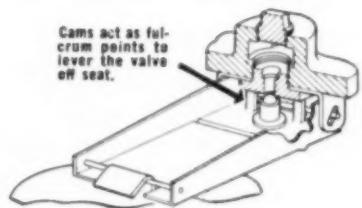


# See how this NEW trap handles greater volume in less time

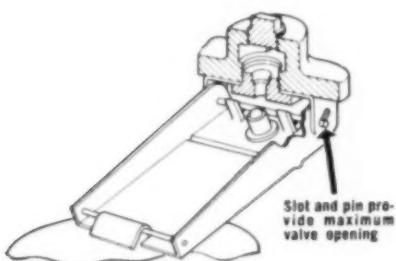
Yet it's small—gives you maximum capacity per dollar cost

## NEW SARCO INVERTED BUCKET TRAP

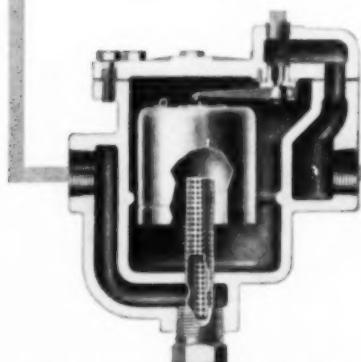
with CAMLIFT valve mechanism



As bucket sinks CAMLIFT mechanism provides the powerful crowbar action needed to open large valve against steam pressure.

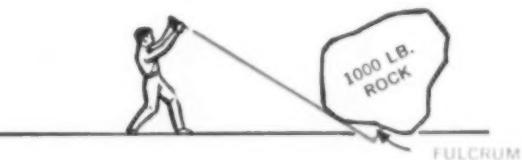


When steam pressure is overcome CAMLIFT mechanism drops to limit of slot, allowing rapid and free discharge of condensate.

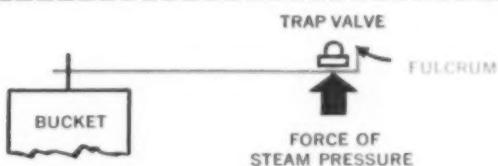


### MAIL THIS COUPON TODAY FOR FREE TRIAL

Put this new inverted bucket trap to the test—see for yourself how to get more for your trap dollar.



MAN WITH CROWBAR MOVES 5 TIMES HIS WEIGHT



### TRAP WITH CAMLIFT MECHANISM OPENS LARGE VALVE AGAINST MAXIMUM OPERATING PRESSURES

SARCO takes the principle of the fulcrum, incorporates it in its newly designed trap and gives you greater discharge with no increase in trap size. That means you get more for your steam trap dollar.

The Sarco Camlift valve mechanism makes this possible. It provides the powerful force needed to open the unusually large valve without a corresponding increase in trap size.

If you need a trap that's also rugged and simple in design, then we suggest you try this new Sarco Inverted Bucket Trap—in fact, we'd like to send you one for a free trial. We're confident you'll be convinced. Just clip the coupon and mail it in.

**SARCO COMPANY, INC., Empire State Bldg., New York 1, N.Y.**

Sarco Canada Ltd., Toronto 8, Ont.

Represented in Principal Cities

Sarco Company, Inc., Empire State Bldg., New York 1, N.Y.  
Gentlemen: Please send me a  $\frac{1}{2}$ " Sarco Type B Bucket Trap for free trial. Maximum working pressure \_\_\_\_\_ psi; capacity \_\_\_\_\_ lbs./hr. condensate.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

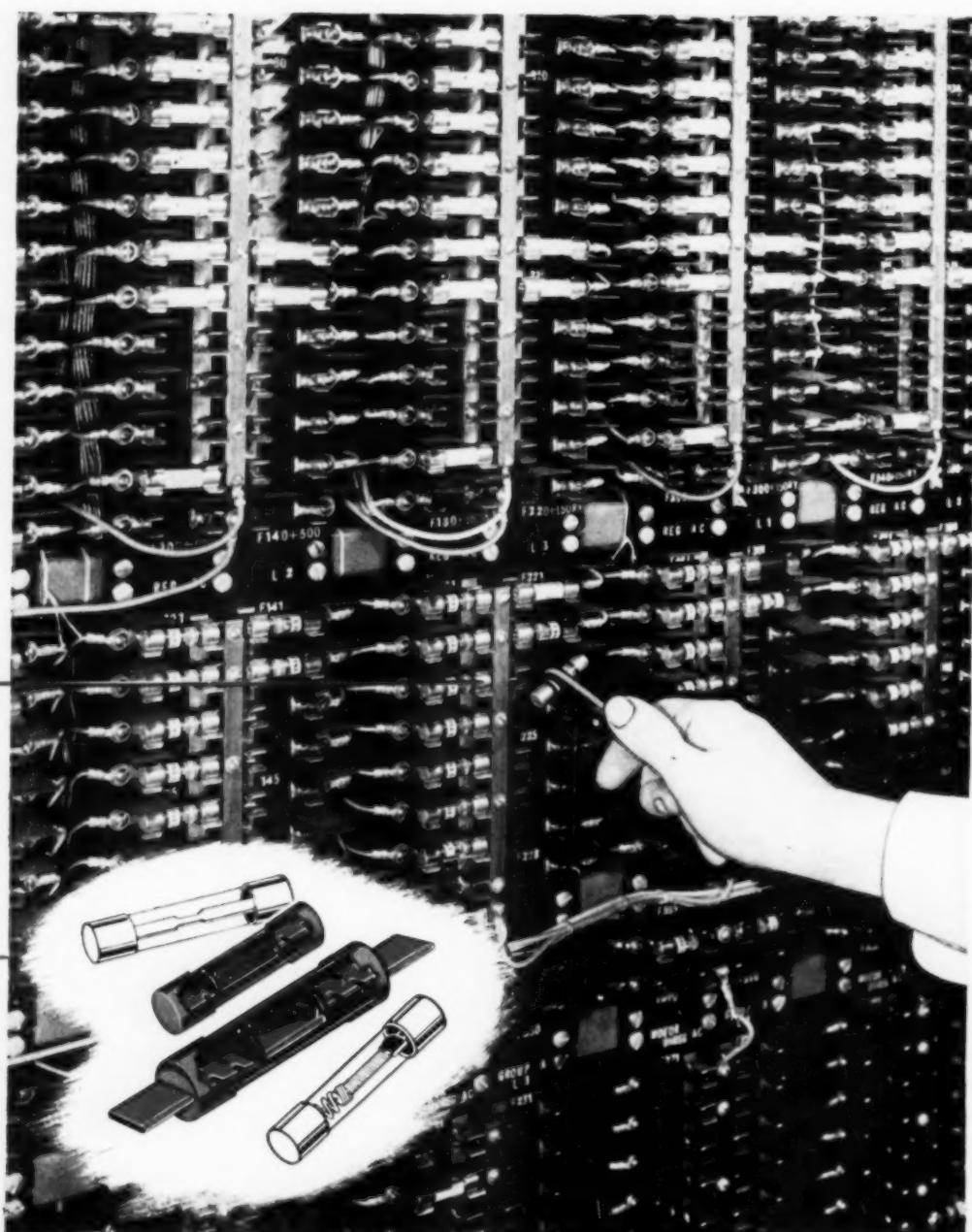
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STEAM TRAPS • TEMPERATURE CONTROLS • STRAINERS • HEATING SPECIALTIES

# More Than 400 FUSETRON and BUSS Fuses are used in IBM's Electronic Data Processing Machines





The new IBM electronic data processing machines, made up of eleven units, can multiply or divide more than 2,000 times a second, and add or subtract more than 16,000 times a second.

In these electronic data processing machines, protection of the intricate wiring is of the utmost importance. IBM uses between 400 and 500 FUSETRON and BUSS fuses in each of its new '701' high speed calculators.

On circuits where surge currents might cause an ordinary fuse to blow needlessly, IBM specifies FUSETRON dual-element fuses because of their long time-lag. On other circuits where no surges occur, or where even a short-lived surge might cause damage, single-element BUSS indicating fuses are used for fast opening in case a fault occurs.

When this newest and most powerful high speed electronic calculator was displayed at IBM World Headquarters on March 27th of this year, FUSETRON and BUSS fuses were one of the component parts that made the operation of this spectacular machine possible.

## You Can Have The Same BUSS Dependability and Accuracy in Your Plant . . .

FUSETRON dual-element fuses for the protection of industrial and commercial circuits are made with the same precision demanded for this ultra-modern IBM equipment. That's why FUSETRON fuses, used throughout the entire electrical system give you a degree of protection obtained with no other device.

And, don't forget — FUSETRON fuses not only give you protection against short-circuits, they give 10 point protection: 1. Protect against short-circuits. 2. Protect against needless blows caused by harmless overloads. 3. Protect against needless blows caused by excessive heating —

lesser resistance results in much cooler operation. 4. Provide thermal protection — for panels and switches against damage from heating due to poor contact. 5. Protect motors against burnout from overloading. 6. Protect motors against burnout due to single phasing. 7. Give double burnout protection to large motors — without extra cost. 8. Make protection of small motors simple and inexpensive. 9. Protect against waste of space and money — permit use of proper size switches and panels. 10. Protect coils, transformers and solenoids against burnout.



**BUSS**

### *Start Saving With Fusetron Fuses*



FOR MORE  
INFORMATION  
use this  
coupon

BUSSMANN MFG. CO.  
University at Jefferson, St. Louis 7, Mo.  
(Division of McGraw Electric Co.)

Please send me complete facts about  
FUSETRON dual-element fuses.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

\*FUSETRON is a trade mark of the Bussmann Mfg. Co., Division of McGraw Electric Co.

**what**

**900,000  
impulse<sup>®</sup> steam  
traps are doing  
for Industry...**



Over 900,000 Yarway Impulse Steam Traps have been bought for use throughout industry.

Yarway Impulse Traps are popular because they are small and lightweight . . . easily installed. They require but little maintenance. Body and all working parts are stainless steel. A trap can be serviced and back in the line in 5 minutes.

Yarways are good for all pressures without change of valve or seat. They will not freeze up. Initial cost is low.

BUT THE BIGGEST REASON SO MANY YARWAY IMPULSE STEAM TRAPS HAVE BEEN ORDERED AND REORDERED IS WHAT THEY DO FOR PLANT OWNERS AND OPERATORS.

Now is the time to find what the Yarway Impulse Steam Trap will do for you.

Get immediate delivery from the nearest of 250 local distributors. Name on request. Ask about the FREE 60-DAY TRIAL OFFER.

For free Trap Selector, write,

**YARNALL-WARING COMPANY**

Home Office: 116 Mermaid Ave., Philadelphia 18, Pa.  
Southern Representative: ROGER A. MARTIN, Bona Allen Bldg., Atlanta 3, Ga.



ACTUAL SIZE 3/4" TRAP

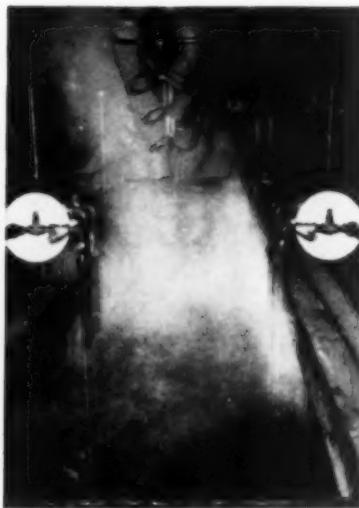
**it floats  
on the load!**

- This little valve—the only moving part in the Yarway Impulse Steam Trap—actually floats on the condensate load, keeping hot steam in the equipment every minute of operating time. That's why Yarway Impulse Steam Traps get equipment hot in a hurry, and keep it hot.

**YARWAY<sup>®</sup>**

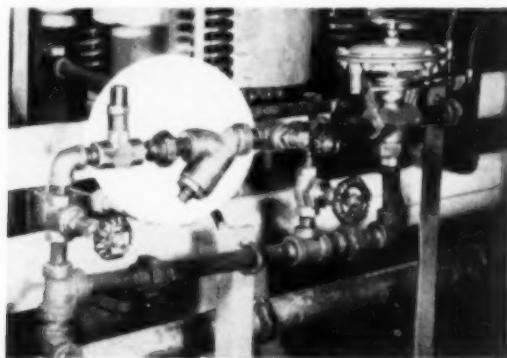
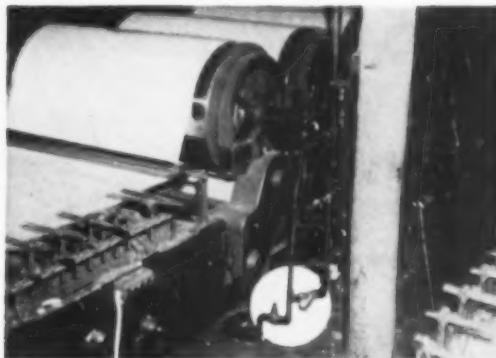


▲ PRODUCTION INCREASED 30% when **RECORD MANUFACTURER** put Yarway Impulse Traps on presses.



▲ TONNAGE INCREASED 35% at tar bath vat after **PIPE FOUNDRY** installed Yarway Impulse Traps.

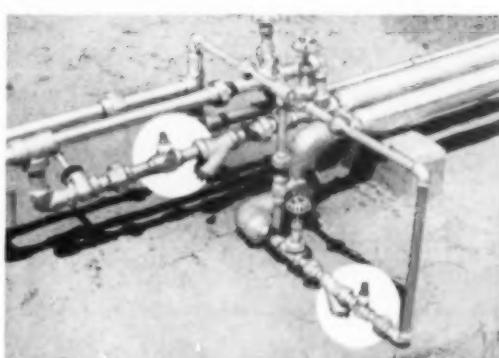
50 FT. MORE FLAT-WORK PER MINUTE after **LAUNDRY** equipped 8-roll ironer with Yarway Traps.



▲ FASTER HEATING on slashers, and EVEN TEMPERATURES on dry cans experienced by **TEXTILE PLANT** after switching to Yarway Traps.



5 MORE BATCHES PER DAY from cooking kettles when **TOMATO CANNERY** installed Yarway Traps.



FREEZE-UPS ELIMINATED after putting Yarway Impulse Traps on outside lines at **PETROLEUM PLANT**.

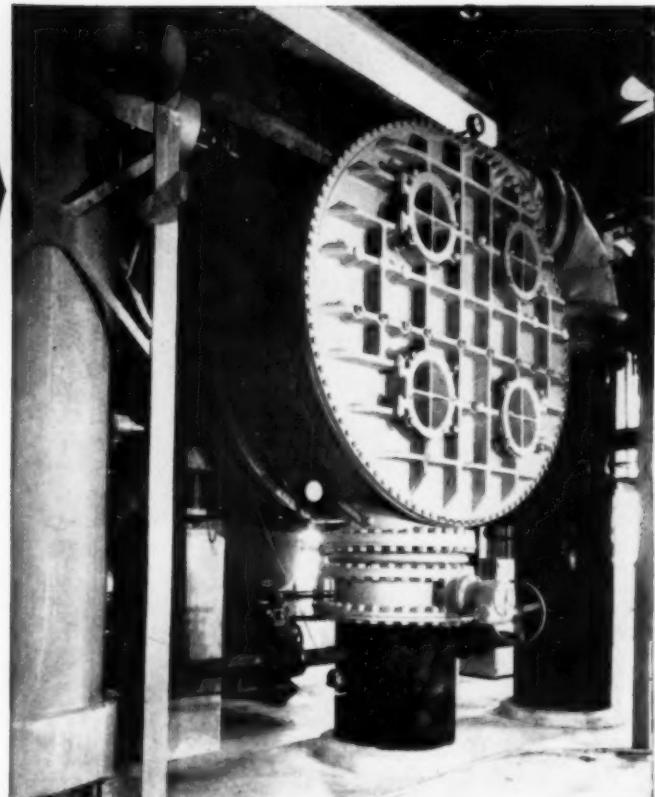
## impulse® steam traps

**Top Turbine Performance  
at Brazos River Plant  
Assured by CONSECO  
Condenser and Heater Unit**

**Heater Handles 123,000-lb.  
Feedwater Per Hour**

Another example of the way Conseco Equipment helps step up central station performance is found at Brazos River, Texas, plant of Brazos River Power Transmission Electric Co-op.

Here a 14,000 sq. ft. 2 pass, non-divided flow Conseco Condenser, with horizontal type hot well and spring supports, handles a 11,500 kw. turbine.



As pictured in above photograph, a Conseco Feedwater Heater at left of condenser is a high pressure vertical unit handling 123,000 lb. of feedwater per hr., from 293 deg. to 362 deg. F at 800 psig extraction steam. Heater is fitted with cast-steel heads and is of the pull-through type.

Besides the high-pressure unit shown, this Conseco Feed Heating installation includes a low-pressure horizontal unit and an intermediate pressure vertical unit. Shown below at right, is the Conseco Air Injector installed at Brazos River. It is of the twin-element, two-stage type, with separate inter and after condensers.

**CONSULT CONSECO ENGINEERS** about your condenser and feedwater heater needs. They will be glad to tell about the advanced features which assure trouble-free, low cost performance in your plant



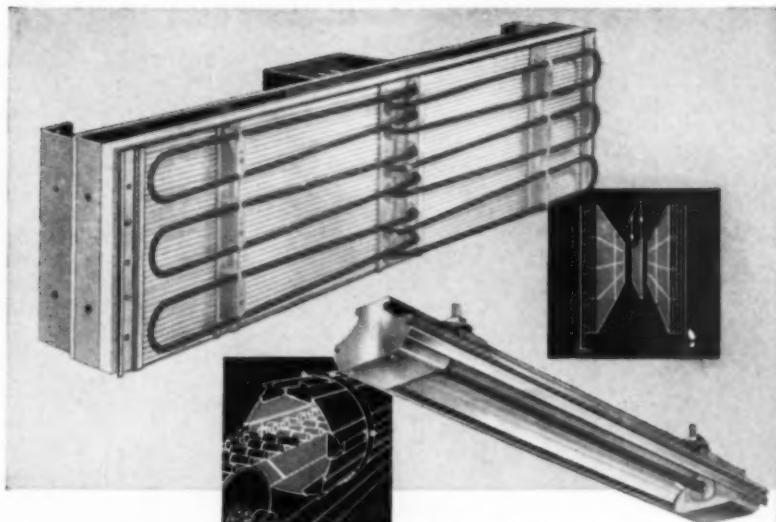
Conseco Twin Element, Two-Stage Air Injector installed at Brazos River Plant, Texas

**CONSECO LINE includes:**

BOILERS • CONDENSERS • STEAM AIR JET EJECTORS • DEAERATORS • CLOSED HEATERS



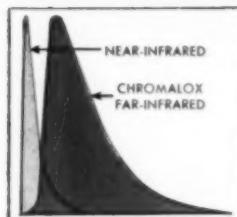
**CONDENSER  
SERVICE & ENGINEERING CO.**  
HOBOKEN, NEW JERSEY



## CHROMALOX Far-infrared solves hundreds of heating problems

Here's your quick, economical and easy solution for curing, drying, degreasing, dehydrating, baking and other heating jobs. Pre-engineered Chromalox Units make oven building as simple as A-B-C, generate uniformly absorbed far-infrared heat for a multiplicity of processing needs. Temperatures up to 700° F are easily selected, accurately maintained. Low initial cost, low write-off cost, low operating cost!

### ONLY CHROMALOX GIVES YOU ALL THESE ADVANTAGES



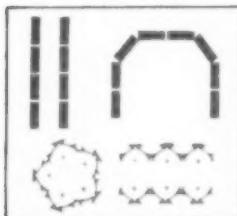
#### Color Blind Radiation

Larger far-infrared wave lengths are absorbed efficiently by all colors and textures.



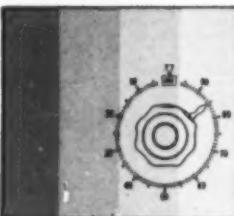
#### Heat Without Hot or Cold Spots

Chromalox radiant energy goes to work in a uniform pattern to span widest conveyor.



#### Low-Cost Oven Assembly

Pre-engineered Chromalox units require minimum expense to erect into complete ovens.



#### Infinitely Variable Heat Output

Heat from 0 to 100% of capacity to fit the exact temperature needs of the work.

*plus*

#### SHATTERPROOF CONSTRUCTION

—nothing to break or contaminate the work in process.

#### NON-DIMINISHING OUTPUT

—with all-metal Chromalox tubular far-infrared generators.

#### HIGH INTENSITY RADIATION

—with top BTUs per square foot.

#### QUICK HEAT-UP

—with energy transformed instantly into heat on the work.

#### ADDITIONALLY SAFE

—for any work involving volatiles.

#### MINIMUM MAINTENANCE

—Because of metal-sheathed, shock-resistant, long-lasting Chromalox tubular generators.

**CHROMALOX** *Electric Heat*  
FOR MODERN INDUSTRY

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- R-111: Drying Silicon Carbide Discs
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#### ASPHALT

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- R-105: Heating Asphalt to Improve Sealing of Batteries
- R-203: Drying Asphalt Tile

#### AUTOMOTIVE

- R-126: Drying Tractor Parts
- R-118: Baking Synthetic Enamel on Gasoline Engines
- Also see: Paint Baking

#### BATTERY

- R-105: Heating Asphalt to Improve Sealing of Batteries
- BOTTLING (see Glass)**

#### CERAMICS

- R-115: Drying a Water-Base Glaze on Ceramic Tile
- R-134: Preheating Dinnerware to Prevent Warping
- R-137: Drying Pottery

#### CHEMICALS (see Plastics)

- COMFORT HEATING**
- L-1077: Keep Men Warm, Keep Work on Schedule
- R-114: Comfort Heating for a Foundry Worker

#### DEGREASING

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- Also see: Paint Baking

#### DRUGS (see Glass)

- ELECTRONICS**
- R-109: Drying Cement Base in Television Tubes

#### FINISHES (see Paint Baking, Degreasing)

- FOUNDRY**
- L-1060: Skin Drying of Molds
- L-1085: Core Drying
- L-1096: Shell Molding Goes Automatic
- R-115: Comfort Heating for the Foundry Worker
- R-130: Drying Precision Plaster Molds
- R-135: Shell Molding

#### GLASS

- C & R-2: Sterilizing & Preheating Bottles
- R-127: Heating Television Tubes to Bake Interior Graphite Coating

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- L-1064: Drying Lacquered Metal Parts
- L-1065: Improves Enamel Baking Five Ways
- L-1066: Bakes Big Parts or Small, Fast or Slow
- L-1080: Baking Paint on Radiators
- R-118: Baking Synthetic Enamel on Gasoline Engines
- R-119: Baking Paint on Metal Awnings
- R-131: Baking Paint on Meter Parts
- R-138: Drying Ink and Paint on Toothpaste Tubes

#### PAPER

- R-134: Drying Glued Paper Sheeting

#### PLASTICS

- L-1086: Drying Vinyl Coating on Imitation Leather
- L-1091: Post-Forming Formica
- R-101: Molding Kapok Center for Softballs
- R-102: Drying Plastic Powder
- R-104: Preheat Microtite Strips for Punching
- R-121: Dehydrating Vinyl Sheets
- R-123: Drying Plastic Laminates
- R-128: Curing Plastic Coating on Spring Clips
- R-129: Fusing Vinyl to Chip Board
- R-132: Embossing Vinyl
- RP-210: Heating Plexiglas for Vacuum Forming
- RP-202: Heating Thermoplastic for Vacuum Forming

#### PRINTING

- L-1090: Silk Screen Process Drying
- R-103: Static Removal
- R-107: Drying Ink on a Miehle Vertical Press
- R-108: Ink Drying on 8-Unit Web-Fed Offset Press
- R-110: Eliminating "Offset" on Duplicating Machines
- R-124: Drying Ink on a Goss Press
- R-136: Silk Screen Process Drying

#### REFRIGERATION

- L-1055: Dehydrating Refrigerator Coils

#### RESTAURANT

- Far-Infrared Food Warmer

#### RUBBER

- L-1056: Curing Latex Foam Sponge Rubber
- R-125: Cementing Crepe Rubber to Wooden Soles

#### TEXTILES

- L-1068: Fusing Vinyl to Cloth Work Gloves

- R-112: Dehydrating Braiding Material

EDWIN L. WIEGAND CO., Radiant Heating Div.  
7563 Thomas Blvd., Pittsburgh 8, Pa.

- Send me application reports I have checked.
- Have a Chromalox Application Engineer get in touch with me.

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# LONG LIFE EXPANDERS WITH BUILT-IN FLAKE RESERVOIR

The World's Finest tube expander

Floke Reservoirs. Self Oiling.  
Easy To Clean.

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Guide Roller Reduces Mandrel Breakage.



When Ordering Specify Type Collar Desired



**NO. 1**



**NO. 2**



**NO. 3**

DUDLEY "Kneurled" Recess Ball Bearing Collar to automatically set tube flush with face of sheet, eliminates spinning of tube during rolling operation. Also, eliminates "pinning" or "pinching" tubes, saving labor. U. S. Pat. 2,649,889—Only FRANKLIN has this feature.

DUDLEY "Deep" Recess Ball Bearing Collar to be used in expanding the tube beyond the face of the sheet for rolling or drawing. The "Kneurled" collar eliminates spinning of the tube during the rolling operation, saving labor. U. S. Pat. 2,649,889—Only FRANKLIN has this feature.

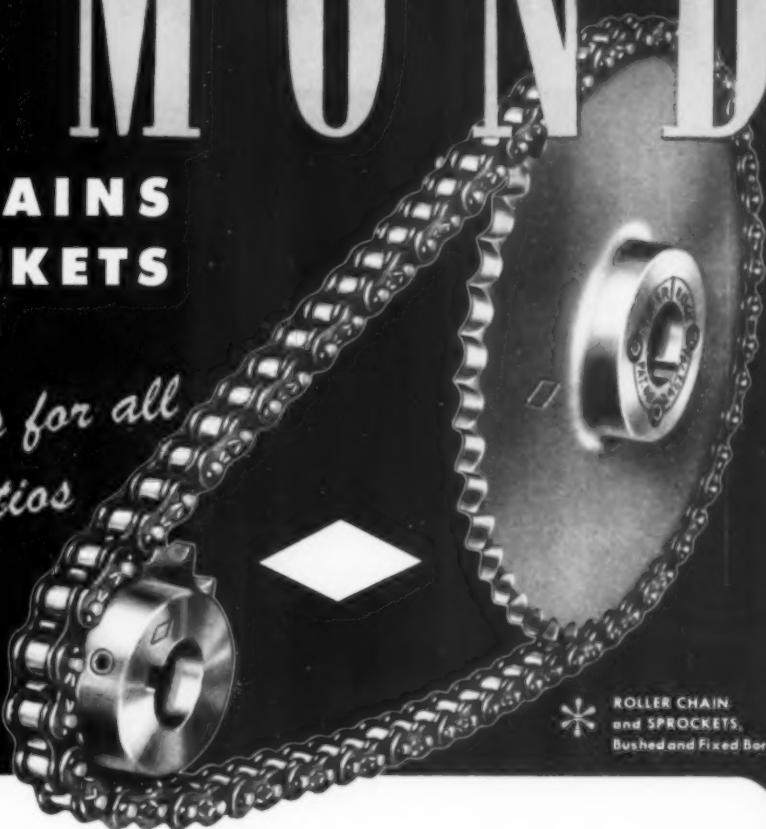
DUDLEY "Flush" Recess Ball Bearing Collar to be used in expanding the tube beyond the face of the sheet for rolling or drawing. The "Kneurled" collar eliminates spinning of the tube during the rolling operation, saving labor. U. S. Pat. 2,649,889—Only FRANKLIN has this feature.

Dudley Electronic Tube Expander Controls are calibrated to use the Franklin Precision Tube Expander—for accurate results specify Franklin Tube Expanders MANUFACTURING CO., INC. • TWELVE CENTER STREET • WESTMONT 7, NEW JERSEY

# DIAMOND

## ROLLER CHAINS AND SPROCKETS

*A balanced stock\*  
meets requirements for all  
standard drive ratios  
and popular  
H. P. capacities*



ROLLER CHAIN  
and SPROCKETS,  
Bushed and Fixed Bore



### BUSHED SPROCKETS

With the Taper Bore Sprocket and Bushing, the bushing is changed to meet various bore sizes.



### FIXED BORE SPROCKETS

Small size Diamond finished fixed bore stock sprockets (with keyways and set-screws) give the distributor the balanced stock to meet the widest possible chain drive requirements.

## STOCK SPROCKETS FOR ALL POPULAR SHAFT SIZES (Taper Lock and Fixed Bore Types)

The Diamond Chain combination of roller chains, taper bore sprockets and bushings, and the fixed bore sprockets in the small sizes provide for emergency and normal service demands for all standard drive ratios and popular horsepower capacities.

Take advantage of the "over-the-counter" availability of this Diamond stock of Chains and Sprockets for new applications and replacements. This stock is as near as your telephone. See the yellow pages of your classified telephone directory for the address of the Diamond Chain distributor.

### DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Traditional

Dept. 612, 402 Kentucky Ave., Indianapolis 7, Indiana  
Offices and Distributors in All Principal Cities

Catalog 753 Mailed on Request



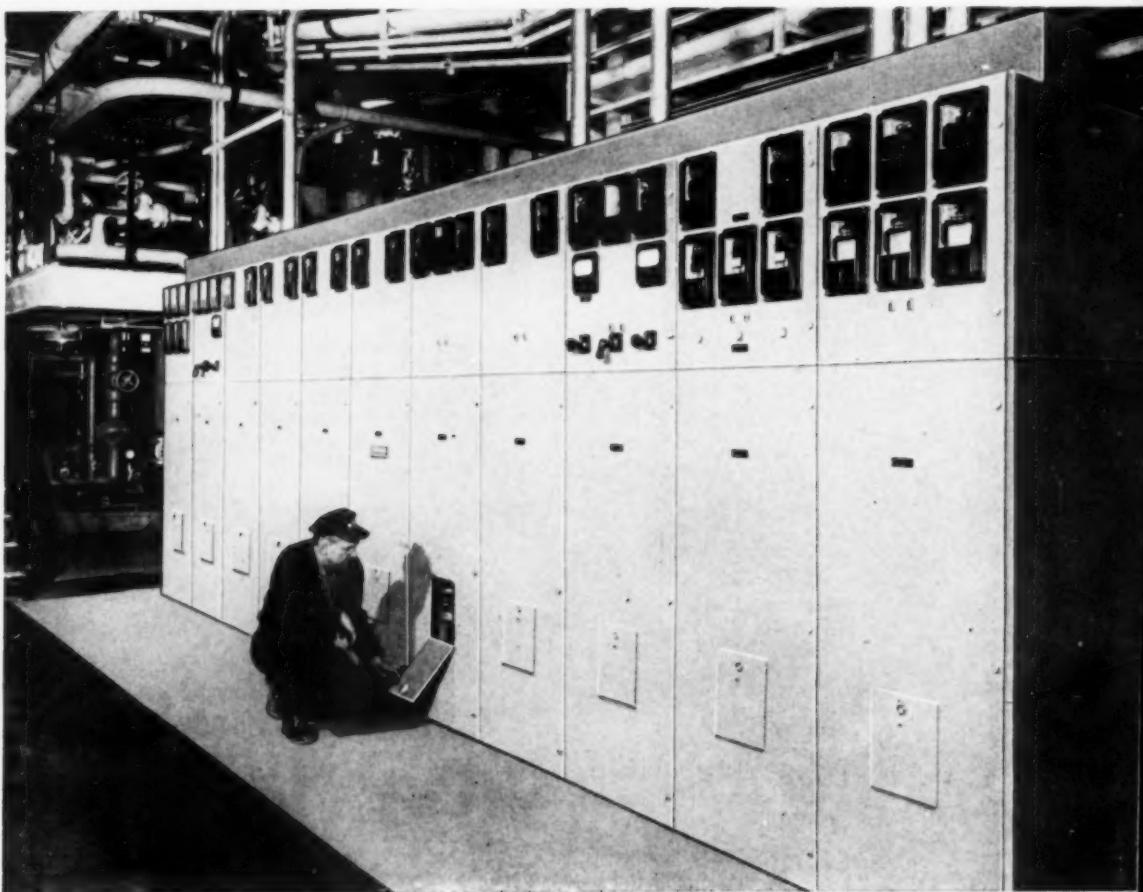
DIAMOND



ROLLER  
CHAINS



# Specify I-T-E switchgear...



Typical installation of Metal-Clad Switchgear. Shown here at the Tucson Gas & Electric Light & Power Co.

**Total cost** is the important figure, when comparing makes and types of switchgear. What will the overall cost be, after the switchgear is *installed* and *operating*? Engineering and planning time—as well as installation, maintenance, and operating costs—must all be included in this total.

The purchase of I-T-E Metal-Clad Switchgear provides a long series of tangible savings—savings felt during every stage of electrical expansion and new construction.

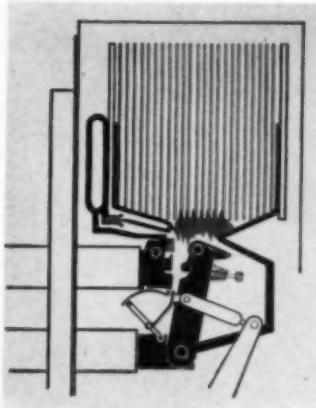


## PLANNING ASSISTANCE

An I-T-E Application Engineer has the experience to help you select coordinated equipment for your specific application problem. This releases your own technical and purchasing staffs for broader planning duties.

# for over-all economy

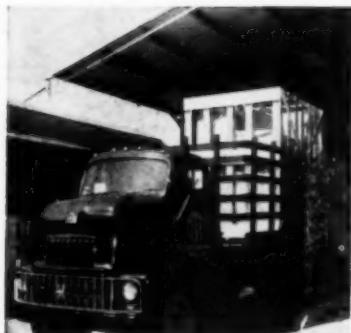
Consider these important benefits  
from I-T-E Metal-Clad Switchgear:



**1**

### Proved performance and reliability

Superiority of the I-T-E method of arc interruption—*in air*—is thoroughly proved by the thousands of efficient I-T-E power circuit breakers now in service.



**2**

### Quick delivery

Through the years, I-T-E has maintained an enviable record in fulfilling delivery promises. Prompt shipment of switchgear helps to keep construction on time or even ahead of schedule.



**3**

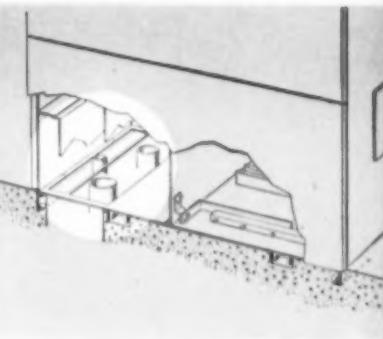
### Simplified testing

I-T-E's unique "fast-test" feature permits secondary circuit testing without opening the circuit breaker compartment door. Racking the horizontal drawout breaker to test position gives safe immediate access to the operating station. Breaker is available for testing in a matter of seconds.

**4**

### Simplified installation

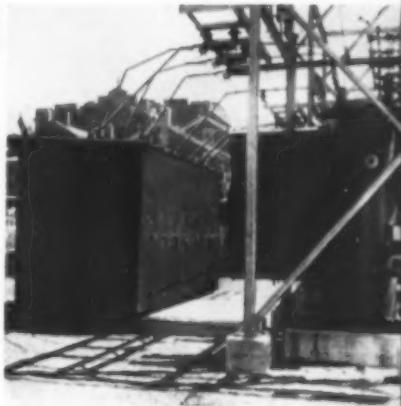
I-T-E switchgear is assembled, tested, and shipped as a complete unit. Floor plan drawings are sent in advance to permit immediate installation of channel base and positioning of conduit or cable. All that remains is to position the switchgear and make necessary connections.



**5**

### Long, trouble-free life

I-T-E selection of premium materials and components pays dividends in long equipment life. Every detail of I-T-E Multumite construction points to continuous, trouble-free service even under the most severe operating conditions.



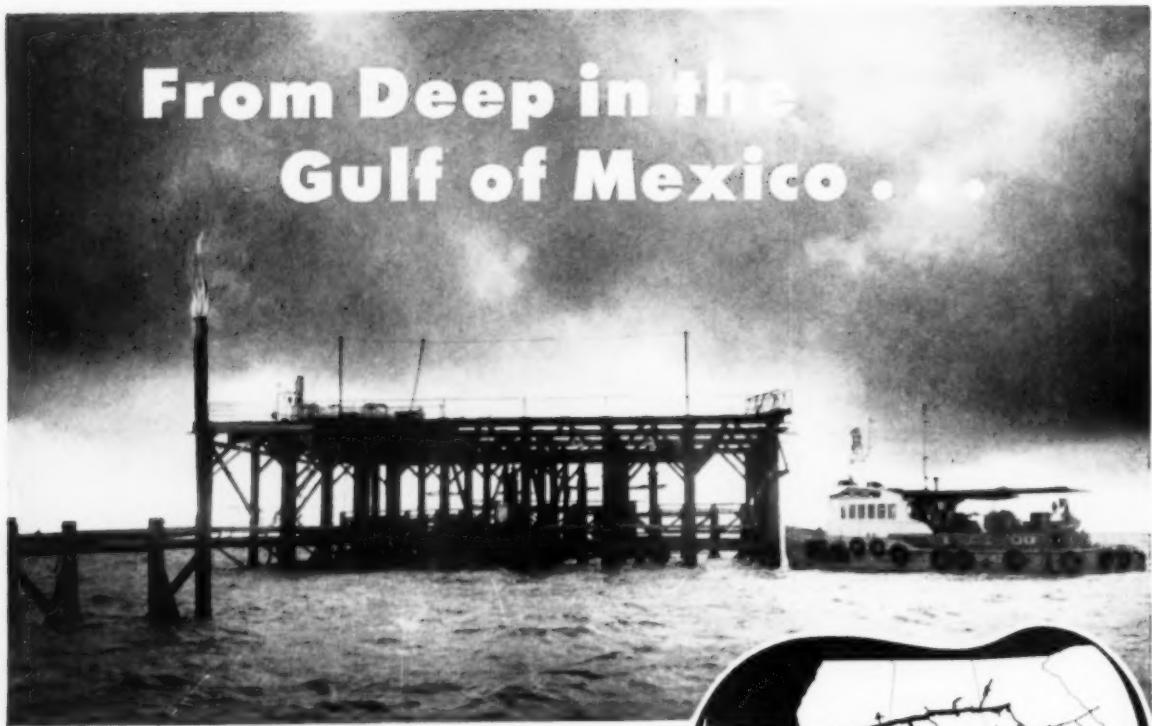
For details call the I-T-E field office nearest you. Look in the classified section of your telephone directory under "Electrical Equipment". Or write for Catalog Sec. 7000. I-T-E Circuit Breaker Co., 19th and Hamilton Sts., Philadelphia 30, Pa.



## METAL-CLAD SWITCHGEAR

SOUTHERN POWER & INDUSTRY for OCTOBER, 1953

# From Deep in the Gulf of Mexico . . .



## A New Gas Supply to Serve the Rapidly Developing *Southeast*

BELOW the off-shore waters of the Gulf of Mexico, and the lakes, rivers and bayous of picturesque southeastern Louisiana, lie rich reserves of natural gas . . . nature's "perfect fuel."

To bring large quantities of this natural gas supply to homes and industries along its growing system, Southern Natural Gas Company is spending more than \$32,000,000.

Some 400 miles of big steel pipe will connect this new gas supply to the Company's present system which also gets gas from other fields in Texas, Louisiana and Mississippi.

Construction has already begun on the \$32,000,000 southeastern Louisiana supply system which is a part of Southern Natural Gas Company's current \$76,000,000 expansion program.

Completion of the proposed expansion program will extend the Company's system into South Carolina and to Savannah on the eastern seaboard. It will boost daily delivery capacity from the present 710 million cubic feet to over a billion cubic feet.

This expansion is necessary to keep pace with the dramatic progress of the southern states which Southern Natural Gas Company is privileged to serve with this "perfect fuel!"

# SOUTHERN NATURAL GAS COMPANY

Watts Building

Birmingham, Alabama

LADISH *Controlled Quality* ASSURES METALLURGICAL SOUNDNESS



Photographed in Ladish  
Metallurgical and Research Laboratories

**TENSILE TEST**

One of many comprehensive  
Ladish laboratory test pro-  
cedures for assuring reliable  
performance.



TO MARK PROGRESS

**Testing the breaking point of metal... proves Ladish fittings have ample strength to meet the test of maximum service**

Optimum strength — proved by scientific test — typifies the outstanding values in Ladish fittings that result from special emphasis on sound metallurgy and advanced facilities. Shown here is modern Universal tensile testing equipment on which ultimate strength, yield strength, reduction of area and elastic properties are carefully measured to assure users of Ladish Controlled Quality fittings the metal quality essential for reliable performance.

THE COMPLETE *Controlled Quality* FITTINGS LINE  
PRODUCED UNDER ONE ROOF... ONE RESPONSIBILITY

**LADISH CO.**

CUDAHY, WISCONSIN  
MILWAUKEE SUBURB

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul  
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • San Francisco • Havana • Mexico City • Bradford, Ont.



# They

## MEET MANY NEEDS!



### Bunting Precision Bronze Bars



Bunting Precision Bronze Bars are especially designed for maintenance work. Completely machined and finished on all surfaces, these bars save costly machining time, wasted metal and wear on cutting tools. They run true when centered in your lathe. They are made of the finest Bearing Bronze—Bunting No. 72 (SAE 660). Always carried in stock by your local Bunting Distributor.

### The Bunting Distributor

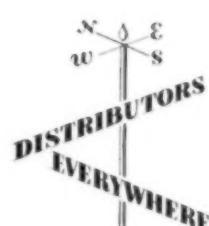


Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, bronze or Bearings, bronze. If he is the leading distributor, he almost certainly is the Bunting Distributor. He carries in stock, for your money saving convenience, completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes meeting all your usual production and maintenance needs. Ask him for catalog.

# Bunting®

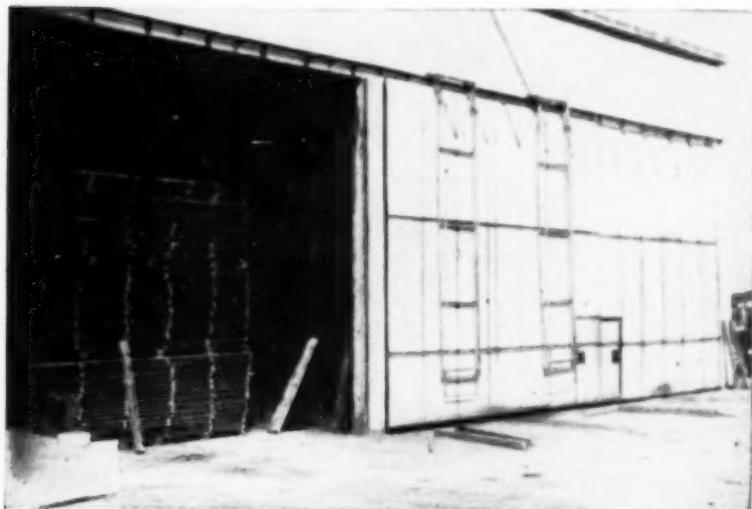
BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES



# "Best" New Dry Kilns Work Better with Armstrong Unit Trapping

4 Traps Increase Capacity 8%



OFTEN a large capital investment in steam heated equipment is not utilized fully simply through failure to drain condensate and air efficiently. Here is a typical case:

Wells-Oates Lumber Co., New Bern, N. C., recently made one of the finest and most modern dry kiln installations possible. And it worked fine. But, it works better now, thanks to the installation of an individual Armstrong steam trap on each of the

four steam coils in the kiln. The kiln cycle time has been reduced from 72 hours to 66 hours. The capacity has thereby been increased over 8% by an investment in traps of only a little over \$200.

The trap installation was made upon the recommendation of DeWitt H. Skinner of Allan T. Shepherd Co., the local Armstrong Representative. The reason behind his recommendation made sense to the Wells-Oates people



▲ One Armstrong No. 215 inverted bucket steam trap is used on each of the four dry kiln coils at Wells-Oates Lumber Co., New Bern, N. C.

◀ The time cycle on this lumber dry kiln was reduced from 72 to 66 hours by Armstrong Unit Trapping.

—“with one trap on each of the four coils of the kiln, all coils would be properly purged of condensate and air and it would, therefore be impossible for one coil to influence the operation of another coil.” The results proved the point.

Your local Armstrong Representative may be able to show you how to get more out of your steam heated equipment. Remember, he sells a product that is guaranteed to satisfy. Call him or write:

You always get more out of equipment  
when you use Armstrong "Unit Trapping"



SEND FOR  
44-PAGE  
STEAM TRAP BOOK  
a Catalog and Educational Handbook on Condensate Drainage

ARMSTRONG MACHINE WORKS

806 Maple Street, Three Rivers, Michigan

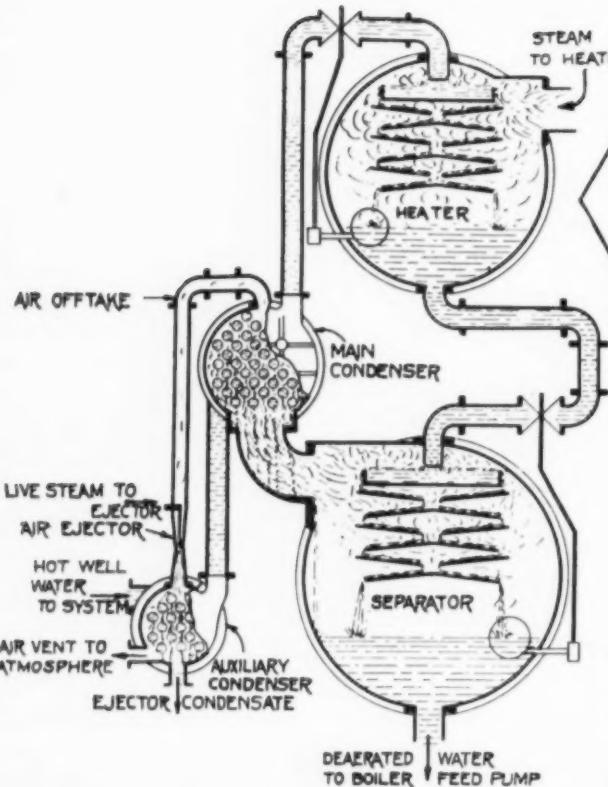
Attach to your Company Letterhead and Mail Today.

ARMSTRONG MACHINE WORKS  
806 Maple Street, Three Rivers, Michigan  
Please send me a Steam Trap Book.

Name \_\_\_\_\_

Title \_\_\_\_\_

# DEAERATION



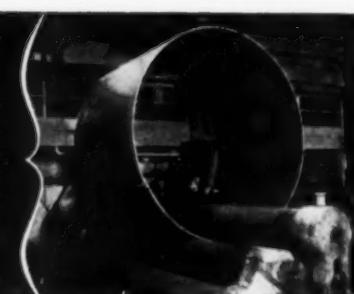
**THE FIRST DEAERATOR,  
DEVELOPED AND BUILT  
BY ELLIOTT IN 1918**



After much research and experimentation in the virgin field of processing feedwater for the removal of oxygen, Elliott engineers in 1918 developed, built and sold the first practical commercial deaerating unit. By 1924 the supreme value of the achievement was recognized in the award to W. S. Elliott of the Edward Longstreth medal by the Franklin Institute, Philadelphia . . . With this commanding lead, backed by valuable pioneering experience, Elliott engineers have continued to set the pace in deaeration development.

## HOW ELLIOTT BUILDS DEAERATING HEATERS

All the work is done right in the Elliott shops. Rolling of shells, welding and fabricating of parts is all handled by Elliott personnel. It's actually custom tailoring in metal, for every unit is built to fit its job.



Rolling a fair-sized shell.



ASME-approved automatic welding is used wherever possible.



# ELLIOTT Company

DEAERATOR AND HEATER DEPARTMENT

N2-2

# has come a long way!

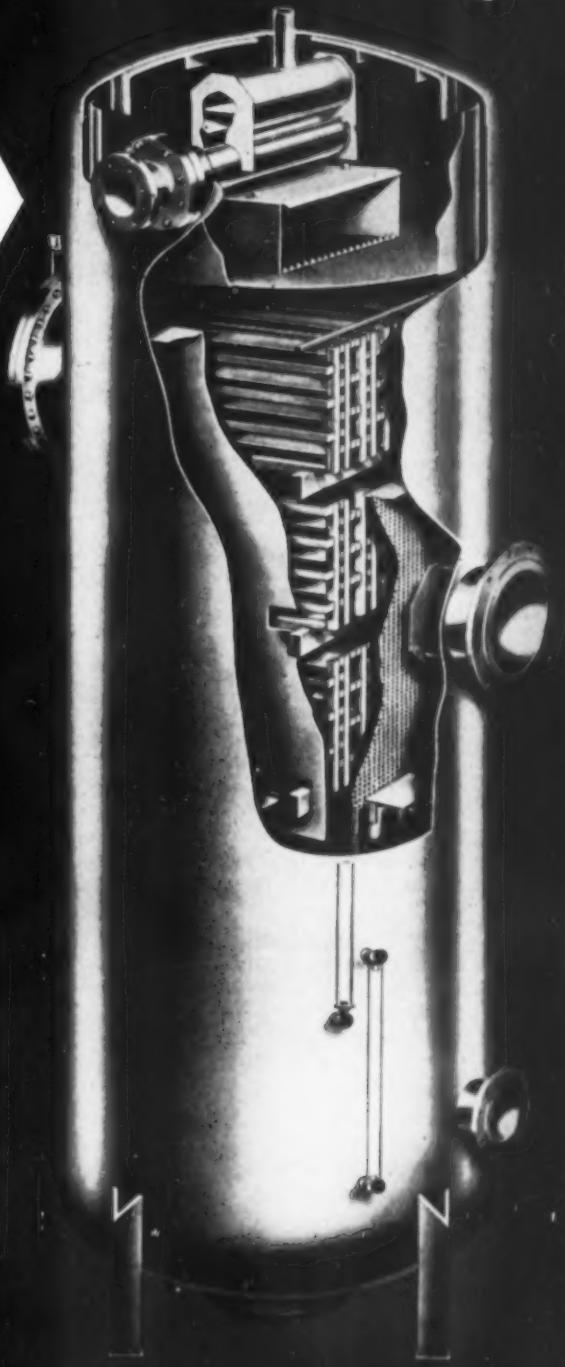
## 1953 THE ELLIOTT DEAERATING HEATER OF TODAY

The modern Elliott deaerating heater combines the three stages of the deaerating process—heating, deaerating and venting—within a single shell, thus eliminating headroom problems and simplifying construction. The tubular vent condenser is replaced by a spray pipe and vent hood, both of stainless steel, which perform the functions of the clumsy, outmoded vent condenser with no maintenance other than occasional inspection. Here in itself is a major saving.

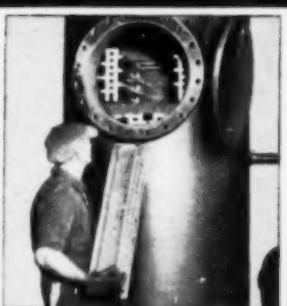
The entire heating section, and in fact all parts in contact with corrosive water, are of stainless steel. Trays, too, are of stainless steel—not only corrosion-free, but far lighter in weight—another factor for lower maintenance.

The picture at right shows the tray-type unit. The Elliott spray-type unit, developed largely for marine use, is also available.

For full details on Elliott deaerating heaters contact your local Elliott representative or write Elliott Company, Jeannette, Pa.



Tack-welding a baffle-plate in place before final welding.



Stainless steel trays are no burden at all in manual handling.



## What is the CASH VALUE of Experience?

To you, the cash value of our experience could mean thousands of dollars. We've had the opportunity to analyze thousands of tubing installations because we are the world's largest manufacturer of tubular steel products. Over the years, we've kept records of our findings. We are happy to offer you the advantages of this unique and valuable "experience file" at no cost to you.

You may be having trouble with high pressures, corrosion, heat, or exposure. Well, before you make a definite decision on your tubing requirements, give us a chance to help you.

No matter how new and unusual your problem appears to be, we may already have the answer to it in our case history "experience file."

The next time you are ready to order tubing, whether in carbon, alloys or stainless steel, consider National Seamless Pipe and Tubing. This applies whether you are rehabilitating present equipment or expanding your facilities. Do yourself a favor. Bring your problems to "tubing headquarters." Write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.



NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.  
(Tubing Specialties)

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**U·S·S NATIONAL Seamless PIPE AND TUBES**

UNITED STATES STEEL



## case history



## easy to terminate

These Okolite-Okoprene 15-KV shielded cables are installed at the Great Northern Paper Company's East Millinocket Plant, Millinocket, Maine. They typify the ease with which this kind of cable is terminated. No pot-heads were required. The termination required far fewer manhours of labor, as contrasted with the involved and expensive operation of terminating other types of cables which require a lead sheath. This is one reason why the switch today is to Okolite-Okoprene rubber-insulated high voltage cables.

**WHY THEY'RE SWITCHING TO OKOLITE**  
rubber-insulated cables for use up to 35,000 volts

There is a distinct trend among industrials and public utilities toward Okolite rubber-insulated cables for high voltage use.

### ADVANTAGES

1. Lighter and easier handling.
2. Eliminates sheath corrosion and fatigue.
3. Simplifies splicing and terminating.
4. Moisture does not affect the insulation.
5. No oil migration at high temperatures or elevations.
6. Flexibility simplifies installation.

### APPLICATIONS

1. Transmission and distribution circuits.
2. Generator and transformer leads.
3. Vertical risers and shaft cables.
4. Submarine power cables.
5. Portable substation cables and test leads.
6. X-ray cables.

Send for this 128-page manual on rubber-insulated high voltage cable. It provides current carrying capacity tables, dimensional data, engineering information and installation procedures, complete instructions and detailed drawings for splices and terminations. Write for Bulletin SP-1075 on your letterhead to The Okonite Company, Passaic, New Jersey.



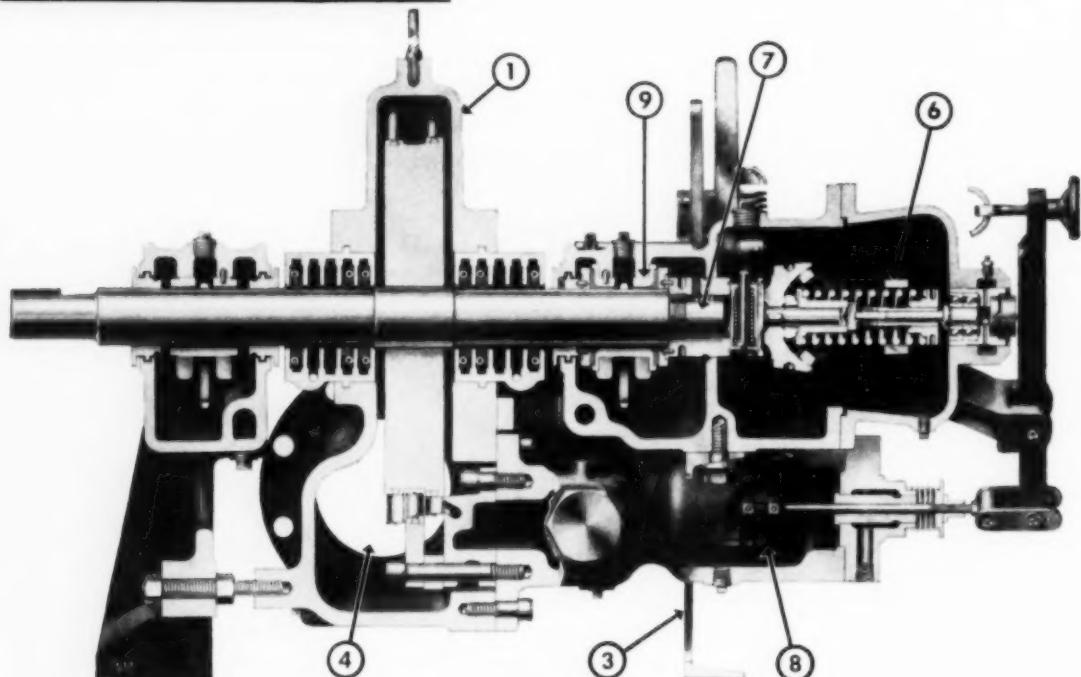
**insulated cables**



**NEW DE LAVAL**  
**HCB**

SINGLE STAGE TURBINE

*can be ordered from stock*



**1 Case and Cover Split Horizontally** on centerline for ease of maintenance.

**2 True Centerline Casing Support** assures distortion-free radial expansion. Not shown.

**3 Flexible Support** at governor end provides for axial expansion.

**4 Exhaust Opening** either right or left side for installation flexibility.

**5 Steam Strainer**, protecting trip and governor valves, is removable for cleaning without

breaking steam connections. Not shown.

**6 Constant Speed Governor** features governor weights pivoted around frictionless surfaces.

**7 Complete Governor Assembly** is now replaceable as a unit.

**8 Balanced Single Seated Main Governor Valve** has proportional flow characteristics for sensitive, positive control.

**9 Shaft Locating Bearing** of adjustable double collar type.

Horsepower: 100 MAX  
Steam Pressure: 300 PSIG MAX  
Steam Temperature: 550F MAX  
Exhaust Pressure: 25 PSIG MAX  
Speed: 4,000 RPM MAX  
Steam Inlet: 2"-250# ASA FLG.  
Exhaust: 6"-150# ASA FLG.  
Weight: 1,200 LB

Here's the new De Laval HCB Single Stage Turbine which is now "on the shelf" . . . ready for immediate shipment. This mechanical drive turbine is simple, rugged, designed for long economical life and low maintenance. For example, note the true centerline casing support, the replaceable governor, the remova-

ble steam strainer. Investigate all the advantages of this versatile driver. It is ready to handle—at low cost—a variety of applications in your plant.

*Send for new Bulletin 4206  
which gives vital facts and figures*



**DE LAVAL Mechanical Drive Turbines**

DE LAVAL STEAM TURBINE COMPANY

817 Nottingham Way, Trenton, 2, New Jersey

**ANOTHER NEW YARD**—The area within the broken lines is the site on which is being built Southern Railway's \$14 million car retarder yard at Chattanooga, Tenn. Our present Citico Yard, in the foreground, will be integrated into the new and larger yard. Work is now in full swing on this new facility and when completed in about 18 months from now, it will be comparable to our ultra-modern yards at Knoxville and Birmingham. From yards such as these come faster, safer movement of freight traffic when routed via the railway that "Serves the South." **SOUTHERN RAILWAY SYSTEM**



# Used in the Most Prominent Buildings



Cram & Ferguson, Architects  
McCarron & Sullivan Co., Plbg. Engineers; M. Ahern & Co., Contractor  
Buerkel & Co., Heating Engineers & Contractors



Compressed air or water operated for controlling all types of water heaters, and diesel engines.



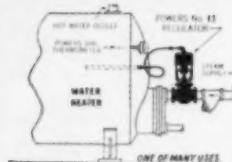
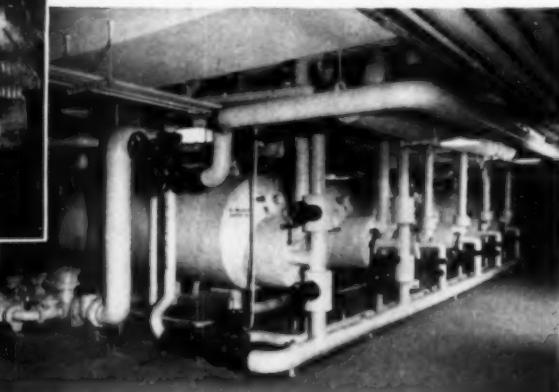
Powers FLOWRITE Valve



Powers Easy to Read Dial Thermometer



Powers Thermostatic Water Mixer. Insures utmost comfort and safety in showers. Many other uses.



Powers No. 11 Self-Operating Temperature Regulator for water storage heaters, hot water converters, dishwashers, fuel oil preheaters, jacket water cooling for air compressors, and diesel engines, etc.

# POWERS

WATER TEMPERATURE CONTROL

In Boston's Famous Landmark

*John Hancock*

MUTUAL LIFE INSURANCE COMPANY  
BUILDING

**Water Heaters**, six of which are shown below; 21 Shower Baths; 7 Dishwashers in the company cafeterias; Photostat Developing Baths for two large photostat machines . . . all are regulated by various types of POWERS Thermostatic devices especially suited for their particular use.

When problems of temperature control arise phone or write POWERS nearest office. With over 60 years' experience and a complete line of controls, some of which are shown below, we can help you find the right solution for your requirements.

(b29)

Established in 1891 • THE POWERS REGULATOR COMPANY • SKOKIE, ILL. • Offices in Over 50 Cities

1333 Spring St., Atlanta, Ga.—101 N. Elm St., Greensboro, N. C.



# PIPING that puts power in its place

*...is part of the "Blaw-Knox Job" for Industry*

In the designing and prefabricating of both power and process piping, Blaw-Knox does a complete job. It is thoroughly equipped for this with modern facilities and a wide range of engineering, chemical, metallurgical and power-distribution knowledge.\*

Blaw-Knox products and services listed at the right give a lift to production, performance and profits in many industries. Write for descriptive literature on any product or service of interest.

\*Power plant engineers also depend upon Blaw-Knox Functional Hangers, Vibration Eliminators and Roller Assemblies to save engineering time and to take care of both ordinary and critical load problems.



MEMBERS OF THE  
BLAW-KNOX "FAMILY"  
AND SOME OF  
THEIR PRODUCTS

**Blaw-Knox Equipment Division**  
Blawnox, Pa.

Concrete Road Paving Machinery  
Clamshell Buckets  
Contractor's Equipment  
Gas Cleaning Equipment  
Open Steel Flooring  
Radio, TV and Transmission Towers  
Steel Forms for Concrete Construction  
Chemical and Process Equipment  
Water Cooled Equipment for  
High Temperature Furnaces

**Bufolevak Equipment Division**  
Buffalo 11, New York and Mora, Minn.  
Machinery for the Chemical and Food  
Processing Industries

Specialized Machinery for the Dairy Industry

**Chemical Plants Division**  
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Complete Chemical, Petrochemical, Industrial

and Petroleum Plants

**Foote Construction Equipment Division**  
Nunda, New York

Block Top Road Pavers

Concrete Road Pavers

**Lewis Machinery Division**  
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Rolling Mills and Auxiliary Machinery for  
Rolling Ferrous and Non-Ferrous Metals

**National Alloy Division**  
Blawnox, Pa.

Alloy Steel Castings for Extreme  
Temperatures, Abrasion and  
Corrosion Resistance

**Power Piping and Sprinkler Division**  
Pittsburgh 33, Pa.

Prefabricated Piping Systems for High  
Pressures and Temperatures. Pipe Hangers

Automatic Sprinkler Systems for  
Fire Protection

**Rolls Division**

(Pittsburgh and Lewis Rolls)

Pittsburgh 1, Pa.

Rolls for Steel and Non-Ferrous Rolling Mills

**Union Steel Castings Division**

Pittsburgh 1, Pa.

Heavy Steel Castings



BRANCH OFFICES:

Birmingham 3, Alabama

Chicago 3, Illinois

Philadelphia 3, Pennsylvania

New York 17, New York

San Francisco 5, California

Washington 5, D. C.

Tulsa 1, Oklahoma

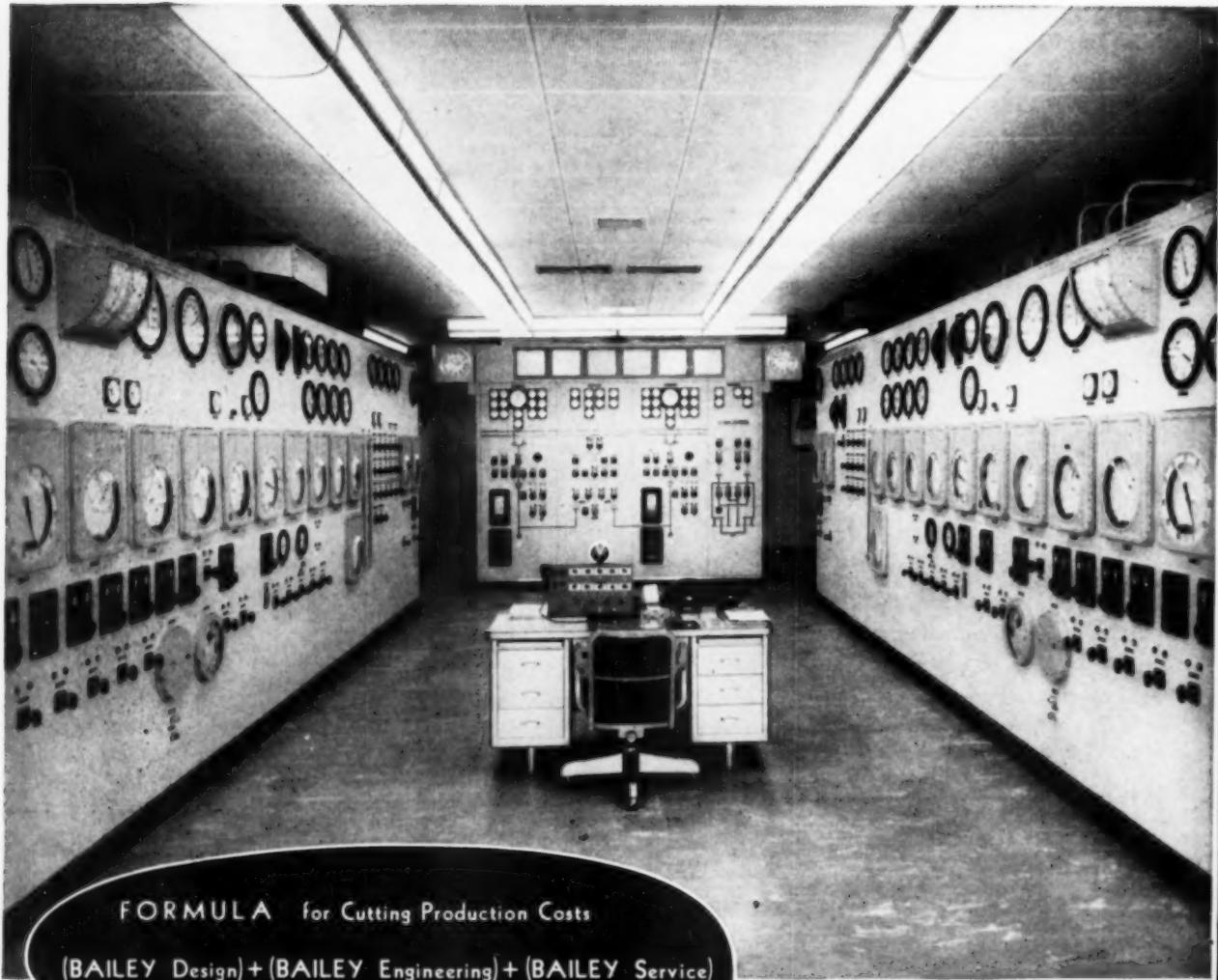
Export—New York 17, New York

© 1953 Blaw-Knox Co.

**BLAW-KNOX**  
*Company*

FARMERS BANK BUILDING  
PITTSBURGH 22, PA.

# How to Control



FORMULA for Cutting Production Costs

(BAILEY Design) + (BAILEY Engineering) + (BAILEY Service)

= GREATER SAVINGS PER FUEL DOLLAR

Control Room at Highgrove Power Plant of California Electric Power Co., Riverside, Calif. In this "outdoor" plant Bailey Control of Combustion, Feed Water, Steam Temperature, Air Heater Temperature, and Fuel Oil Temperature, assists operators in producing low cost steam.

Units 1 & 2 are each rated at 320,000 lb per hr capacity, 850 psi, 900F. They may be fired with gas or oil.

# Steam Cost

★ Close regulation of fuel and air input is vital to a strict control of your steam cost. But that's not all. You'll need control of other factors too. Your power costs can be held down only by controlling all of the important operations in your steam plant. That's where you can be sure of help from Bailey Controls. Here's why they can do the job and do it right:

### 1. Complete Range of Equipment—fully co-ordinated

You need never worry that a Bailey Engineer's recommendation is slanted in favor of a particular type of equipment, as might be the case if he had only a limited line to sell—or that Bailey will pass the buck for efficient control; we offer *complete* boiler control systems.

### 2. Engineering Service—backed by experience

No other manufacturer of instruments and controls can offer as broad an experience, based on successful installations involving all types of combustion, flow measurement, and automatic control.

### 3. Direct Sales-Service—conveniently located near you

Bailey Meter Company's Sales-Service Engineers are located in more industrial centers than those of any other manufacturer of boiler control systems; you get prompt, experienced service with a minimum of travel time and expense.

For close control of steam cost, more power per fuel dollar, less outage, and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey Engineer to arrange a visit to a nearby Bailey installation. We're proud to stand on our record: "More Power To You!"

A-11B-2

**BAILEY**  
METER COMPANY  
1028 IVANHOE ROAD  
CLEVELAND 10, OHIO  
*Complete Controls for Steam Plants*

 BAILEY METERS

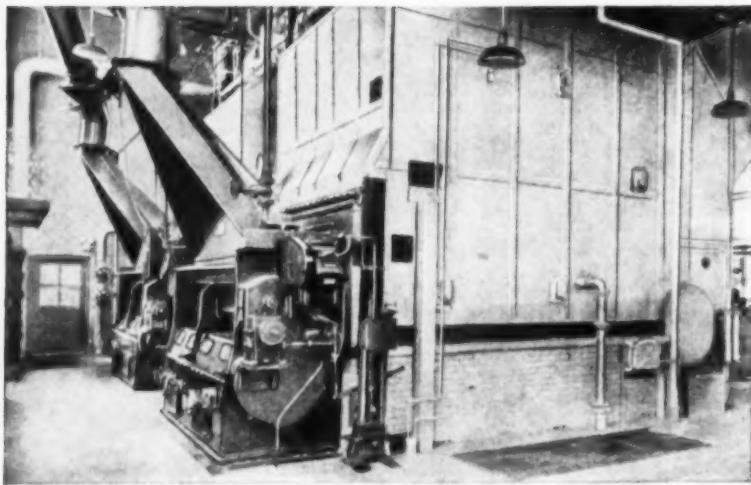
*Controls for*

COMBUSTION  
FEED WATER  
TEMPERATURE  
PRESSURE  
LIQUID LEVEL  
FEED PUMPS

# "COAL'S BEST FOR OUR MODERN PLANT!"

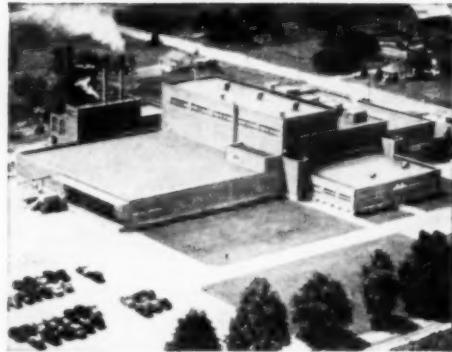
**It's low in cost...  
It's clean and convenient!"**

says G. W. Peters, Engineering Manager  
**M&R DIETETIC LABORATORIES, INC.**  
makers of PREAM & SIMILAC



**Discover for yourself the great advantages of coal** burned the modern way. Call in a consulting engineer. He'll show you how today's combustion equipment can give you 10% to 40% more power from a ton of bituminous coal than from equipment used only a few years ago. He'll show you how modern labor-saving coal and ash-handling equipment make a coal-fired installation clean, convenient, and dust-free.

**If you plan to remodel or build a new plant,** be sure to look into the low cost and convenience of bituminous coal. Consider coal's other advantages, too. It has reserves that are virtually inexhaustible. America's bituminous coal mining industry is the most efficient and productive in the world. With bituminous coal, you can be sure of plenty of fuel at relatively stable prices now and for years to come.



"We made a careful study of fuels and burning equipment before building our modern new plant in Sturgis, Michigan. This plant was designed to produce baby food. So the steam plant has to be clean and dust-free as well as economical to operate. Also, we wanted a fuel we could store safely and easily in order to insure ourselves against any shortages."

"We decided on bituminous coal—and the up-to-date installation shown here. It certainly fills the bill on every count. Our modern combustion equipment makes coal far more economical than any other fuel. Up-to-date coal and ash handling give us convenient operation completely free of dust nuisance."

*Additional case histories, showing how other types of plants have saved money by burning coal the modern way, are available upon request.*

## **If you operate a steam plant, you can't afford to ignore these facts!**

**BITUMINOUS COAL** in most places is today's lowest-cost fuel, and coal reserves in America are adequate for hundreds of years to come.

**COAL** production in the U.S.A. is highly mechanized and by far the most efficient in the world.

**COAL** prices will therefore remain the most stable of all fuels.

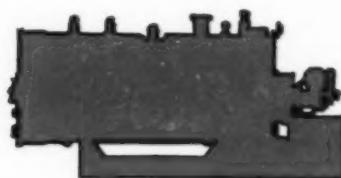
**COAL** is the safest fuel to store and use.

**COAL** is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

**BITUMINOUS COAL INSTITUTE**  
Southern Building, Washington, D. C.

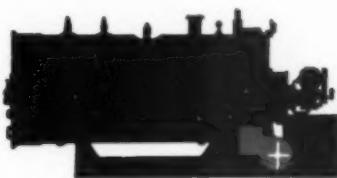
**FOR HIGH EFFICIENCY** **FOR LOW COST**  
**YOU CAN COUNT ON COAL!**

# HOW SUPERIOR SOLVES YOUR STEAM PROBLEMS



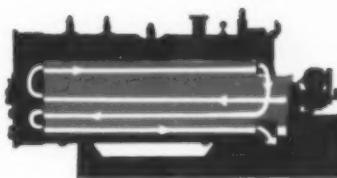
## A COMPLETE PACKAGE

Completely factory-assembled and tested, a Superior Steam Generator is backed by undivided responsibility.



## INDUCED DRAFT THAT'S BUILT-IN

... eliminates need of an expensive chimney ... Multiple fans draw evenly on all tubes, reducing maintenance.



## 4-PASS, DOWN-DRAFT DESIGN

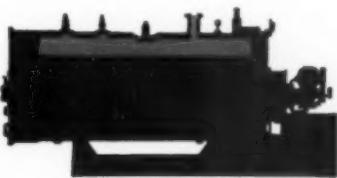
High gas velocities produce high efficiency. Down-draft design promotes rapid evaporation, quicker steaming.



5 sq. ft. per b.h.p.

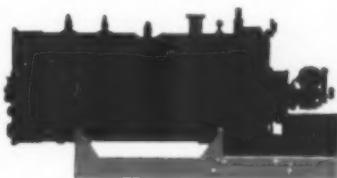
## AMPLE HEATING SURFACE

A minimum of 5 sq. ft. of heating surface per boiler horsepower assures maximum efficiency at full rated capacity.



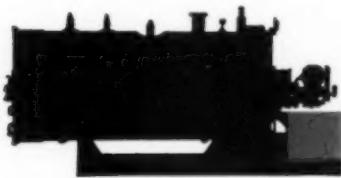
## RESERVE CAPACITY

Greater steam space and large evaporating surface provide ample reserve capacity & better than 99% dry s. am.



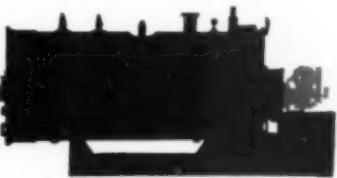
## NO EXPENSIVE FOUNDATION

Built on a rigid channel iron base, a Superior Steam Generator needs only a floor capable of supporting its weight.



## BUILT-IN CONTROLS

All controls essential to completely automatic operation are factory-wired into an easily accessible control panel.



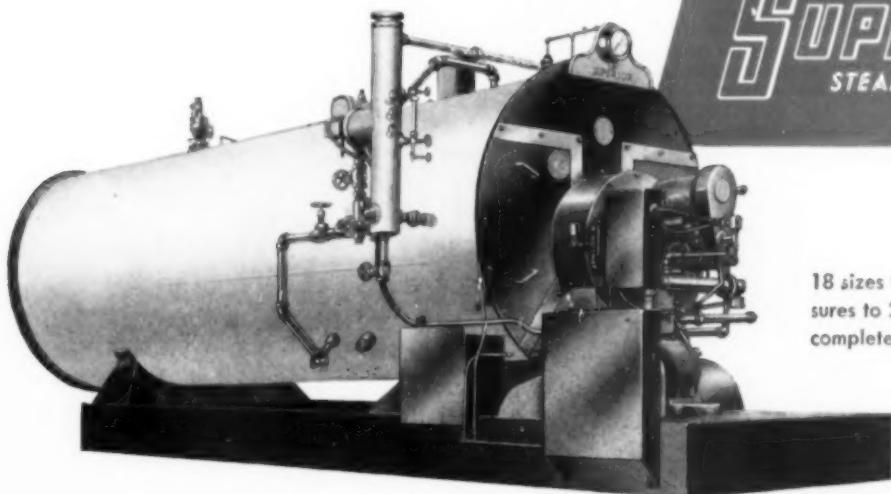
## BURN OIL, GAS, OR BOTH

Superior Burners burn oil or gas or a combination of both ... changing from one fuel to the other in seconds.

Superior Steam Generators are the ideal choice for a new steam plant ... the simplest answer to expanding your present plant ... the easiest solution to replacing obsolete boilers.

Guaranteed to develop maximum rated capacities at thermal efficiencies in excess of 80%, their design embodies features which insure long-lived dependability and maximum fuel economy.

for performance you can **BANK** on



18 sizes from 20 to 600 b.h.p. for pressures to 250 p.s.i. or for hot water. For complete details write for Catalog 511.

**SUPERIOR COMBUSTION INDUSTRIES INC.**

TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

Mail  
TODAY

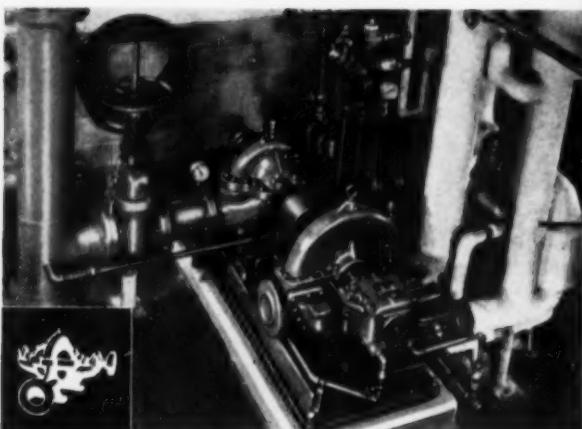
# YOUR BUSINESS DEPENDS ON PUMPS

PEERLESS PUMP DIVISION  
FOOD MACHINERY AND CHEMICAL CORPORATION  
301 West Avenue 26, Los Angeles 31, California

CHECK BULLETINS YOU REQUIRE

FIRE PROTECTION PUMPS TYPE PR  
REFINERY PUMP BULLETTIN B-1605  
MIXED FLOW PUMPS BULLETTIN B-148  
BULLETTIN B-152

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

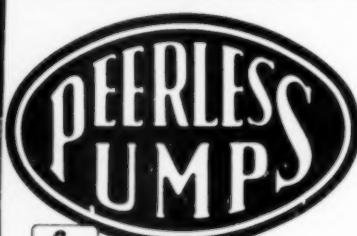
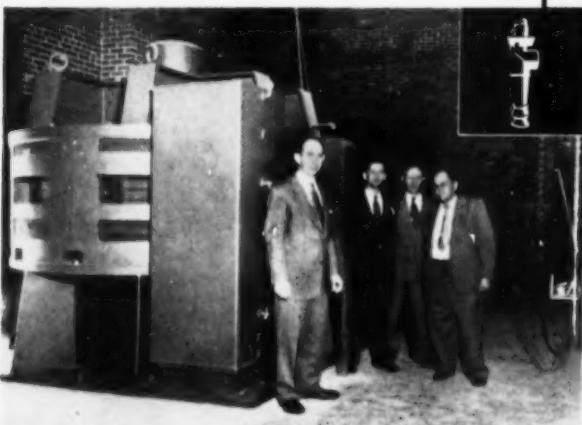
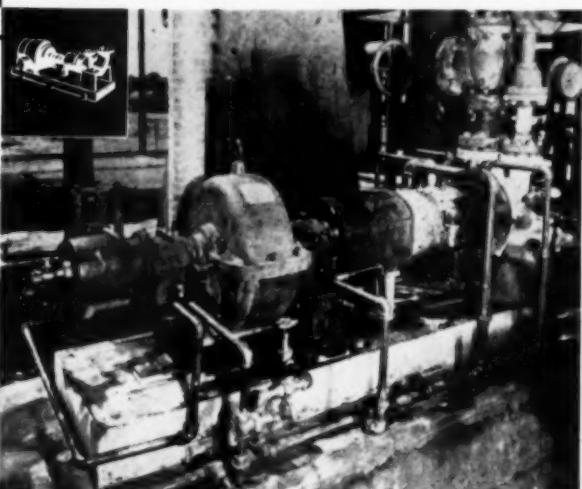


**HEAVY DUTY CENTER-LINE MOUNT PUMPS** —The continuous transfer of crude charge stocks at high temperatures is handled by type PR pumps. The Peerless line of packing gland construction and mechanical shaft seal construction pumps for handling hydrocarbons, chemical solutions and water at elevated temperatures and pressures is most complete. The pump in the view at the right is handling oil at 850° F. in an Oklahoma refinery. These refinery and chemical process pumps have a number of modern design features to recommend their installation. Fully described in Bulletin B-1605.

**VERTICAL FLOOD CONTROL PUMPS** —Peerless mixed flow and propeller type pumps are widely applied to both industrial and public works large volume pumping. These are the giants in the world of pumps. The pump shown below is one of a score of Peerless mixed flood pumps installed in flood control pumping stations along the Ohio River for the Corps of Engineers. Capacities as high as 220,000 gpm can be handled. Widely used by industry for such applications as pumping sea or river water for steam generation stations, process service work in chemical plants, waste disposal and a wide range of similar applications where liquids must be transferred in large volumes against low heads. Fully described in Bulletin B-148.

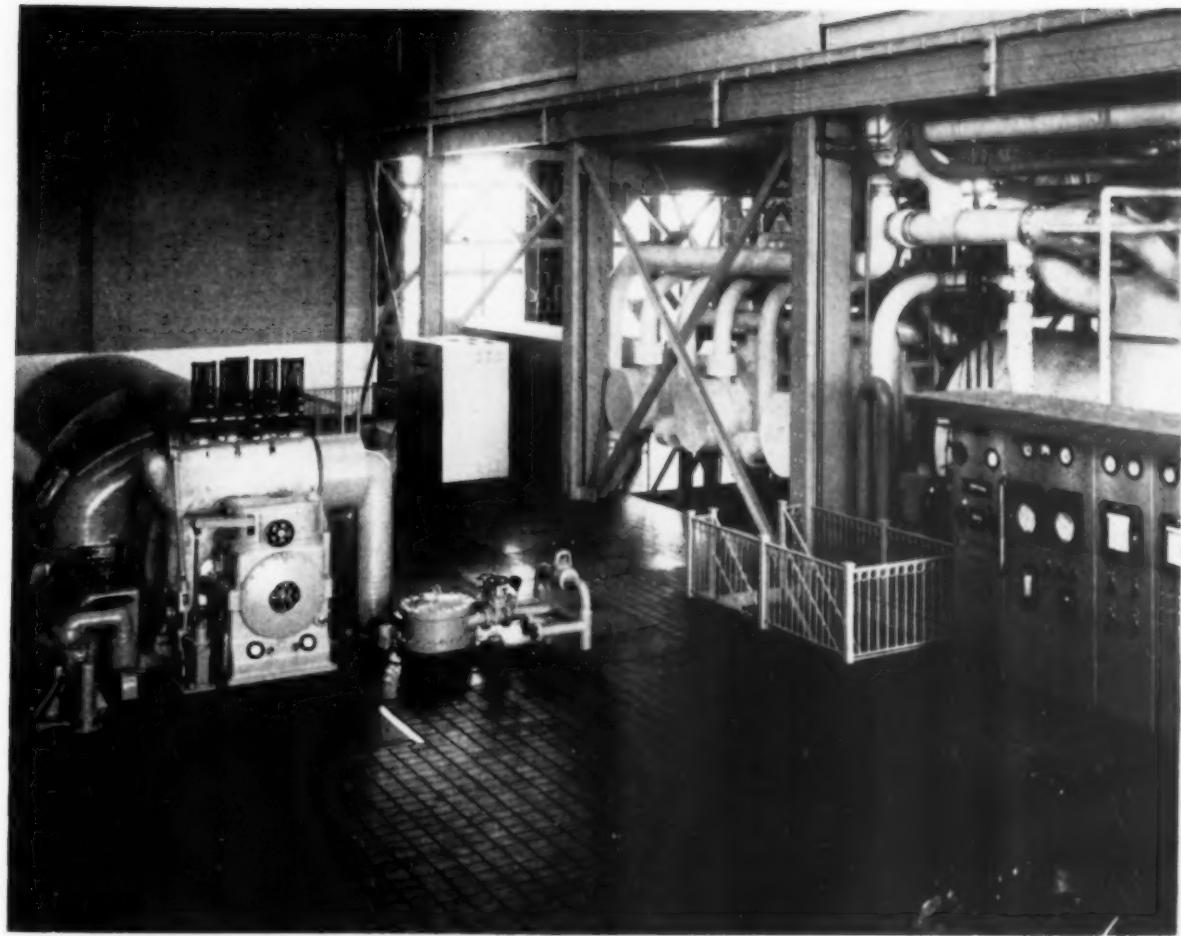
You can do a  
**BETTER JOB**  
with Dependable  
**PEERLESS**  
**PUMPS**

**FIRE PROTECTION PUMPS** —A Peerless fire pump provides permanent and reliable fire protection for every commercial and industrial risk. Peerless, with fully approved fire protection pumps, approved fire protection pump auxiliary equipment, and skilled fire protection pump application service offers unsurpassed protection against the hazards of fire. At the left is a typical Underwriters' approved Type AF Peerless horizontal fire pump, equipped with steam turbine drive. Widest range of approved ratings are available. Described in Bulletins B-1500 and B-152.



**PEERLESS PUMP DIVISION**  
FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Los Angeles, Calif. and Indianapolis, Indiana.  
Offices: New York; Atlanta; Chicago; St. Louis; Indianapolis;  
Phoenix; Fresno; Los Angeles; Tulsa; Dallas; Plainview; and  
Lubbock, Texas; Albuquerque, New Mexico.  
Distributors in Principal Cities; Consult your Telephone Directory.



## You've Got To Be Good

AFTER 67 years service to southern industry, Standard Oil lubricants continue first in point of popularity. The reason is self-evident. To stay first, your product must be *better*, your service *superior* . . . The reputation for offering new lubricants to meet changing machinery needs has always been one of this company's attributes. The combined facilities for testing and research behind Standard Oil lubricants are unequalled. Wherever there are moving parts and friction in

your plant, there are special Standard Oil lubricants to afford *maximum* protection. Whatever your lubrication requirement may be, there's a Standard Oil lubricant "tailored" to fit your needs—designed to do your particular job with economy, dependability and efficiency.

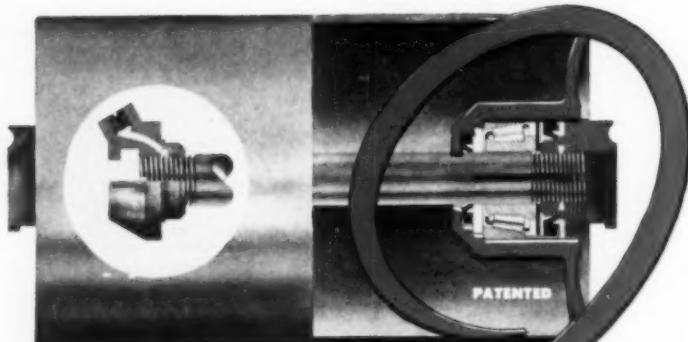
Standard Oil Company  
(KENTUCKY)



# NEW UST\* Continental Idlers

\* UNIT-SEALED PRE-LUBRICATED TIMKEN BEARINGS

*Saves Grease!*  
*Saves Labor!*  
*Saves Belts!*



**UNIT-SEALED**



**PRE-LUBRICATED**



**TIMKEN BEARINGS**

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler without relubrication for 1-2-3 years depending upon the severity or character of conditions.

For detailed information on these idlers write  
for Bulletin SI-116



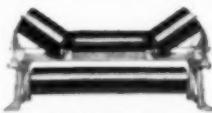
**STANDARD DUTY IDLER**



**SELF-ALIGNING FLAT BELT IDLER**



**RUBBER DISC IMPACT IDLER**



**GRAIN CONCENTRATION IDLER**



**SELF-ALIGNING TROUGHING IDLER**

*Long Life - THE ULTIMATE IN MINIMUM MAINTENANCE*

CG-5209

INDUSTRIAL DIVISION  
**CONTINENTAL GIN COMPANY**

BIRMINGHAM, ALABAMA

ENGINEERS



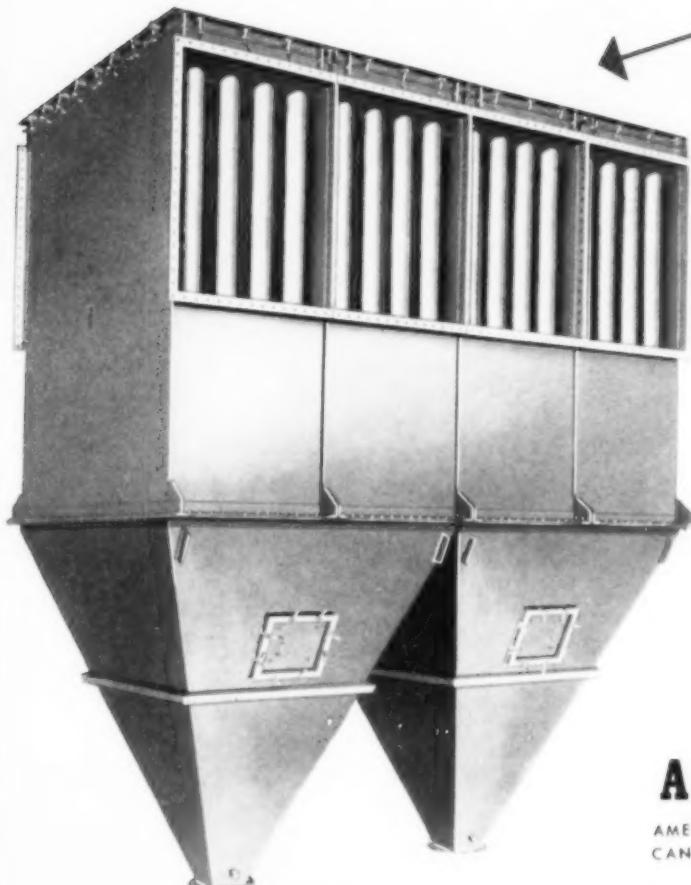
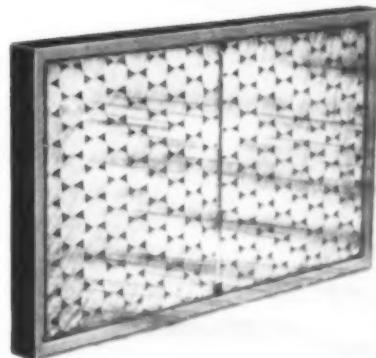
ATLANTA • DALLAS • MEMPHIS • NEW YORK



MANUFACTURERS

**American Blower . . . a time-honored name in air handling**

This forced-air furnace filter catches particles of dust and dirt that otherwise would be carried into the home.



This American Blower Fly Ash Precipitator collects the fly ash that otherwise would settle on the surrounding area from boilers in power plants burning solid fuels.

Both products aid materially in the American plan for better living.

**AMERICAN  BLOWER**

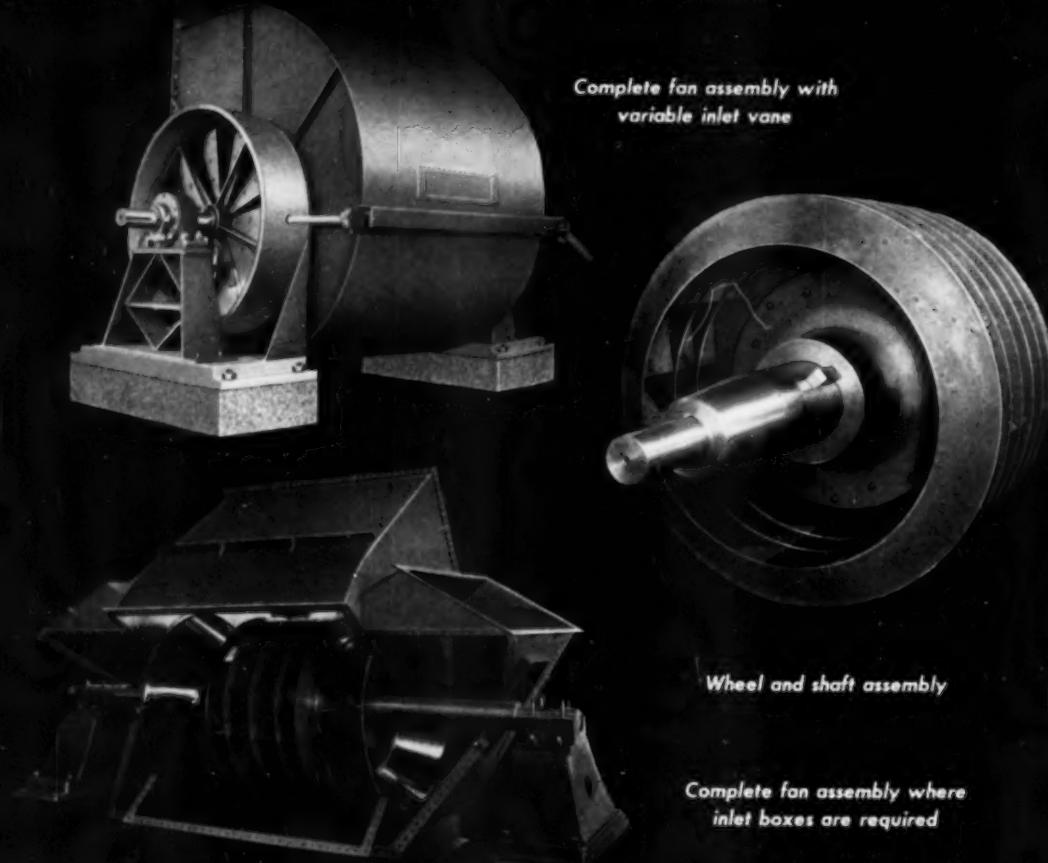
AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN  
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of AMERICAN RADIATOR & Standard Sanitary Corporation

*Serving home and industry*

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS

American Blower... a time-honored name in air handling



Complete fan assembly with  
variable inlet vane

Wheel and shaft assembly

Complete fan assembly where  
inlet boxes are required

AMERICAN HS FORCED DRAFT FAN

Memo to Power Plant Men —

You'll get high efficiency without entry loss and turbulence at a substantial power saving with non-overloading American Blower HS Fans for forced draft duty in your power plant.

**AMERICAN**  **BLOWER**

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN  
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO

Division of **AMERICAN RADIATOR & Standard Sanitary CORPORATION**

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DREW TECHNICAL BULLETIN

## DREW ORGANIC U-14-L

Antifoam, Sludge Conditioner and Stabilizer

Used in conjunction with conventional  
inorganic water treatment to:

- a) Provide protection against carryover
- b) Prevent sludge from adhering to boiler  
metal surfaces
- c) Prevent deposits in pre-boiler section



## DREW ANTI FOAM PREVENTS CARRYOVER

Anything other than dry steam going over from the boiler may lead to difficulties in boiler water systems. Drew Boiler Water Treatment includes highly effective products such as Drew Organic U-14-L for prevention of carryover.

A large food manufacturer in the mid-west was troubled with excessive carryover. Drew Organic U-14-L was recommended after a thorough analysis. It not only stopped the carryover, but also cleared up sludge adherence, which had long been a problem.

To prevent or eliminate industrial water problems in your plant, you'll get results faster and more economically with this Drew program:

1. Thorough study and analysis of the problem
2. Use of effective organic and inorganic products
3. Efficient methods of feeding products to the system
4. Control of dosages by simplified plant testing
5. Service by qualified field engineers
6. Technical assistance by the Drew Technical Department

Write for booklet  
"Drew Organics"  
and technical bulletins.

Power Chemicals Division  
**E. F. DREW & CO., INC.**  
15 East 26th Street, New York 10, N. Y.

AJAX, ONTARIO  
SAN FRANCISCO CHICAGO PHILADELPHIA BOSTON DALLAS ASHEVILLE, N.C.

Service throughout the United States, Canada and South America

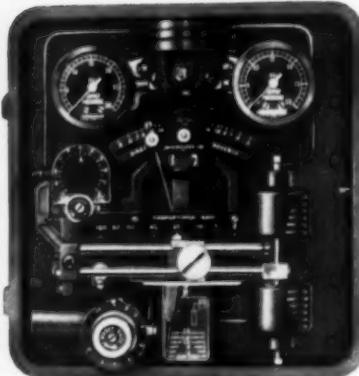


# NEW MASONEILAN 12000 SERIES

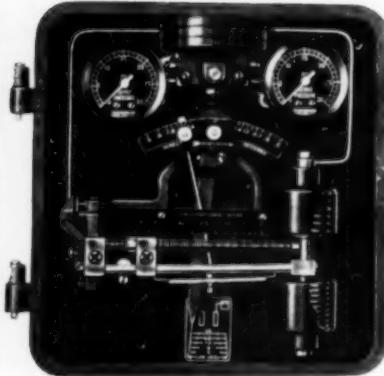
## Easy to Select



Proportional Controller



Proportional-Reset Controller



Pneumatic Transmitter

### 20 INSTRUMENT COMBINATIONS

**Proportional Controller**, which may also be used as a Transmitter, and which may be converted *in the field* to a

**Differential-Gap Controller** by changing one piece of air tubing or to a

**Proportional-Reset Controller** by simple addition of the reset unit. Also

**Pneumatic Transmitter**; or if desired

**Any Combination of Two** of these — same or different units — in a larger case



#### 2 INSTRUMENT LOCATIONS

The instrument may be mounted to left or right of the displacer — at the factory — or in the field. No special tools — no extra parts required.

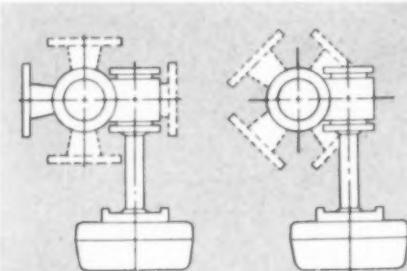


Left Hand Mounting  
on Mid-flange Chamber

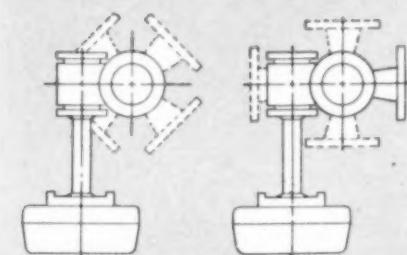
Right Hand  
Mounting  
on Integral  
Chamber

#### 2 DISPLACER CHAMBERS 8 ORIENTATIONS

The instrument may be oriented to connections in any of eight positions when one or more side connections are used. *Mid-flange* in displacer chamber permits field orientation (or, if preferred, integral chamber with factory orientation can be supplied). Top and bottom connections permit installation of *integral* chamber in any desired position.



Right Hand Mounting Orientation

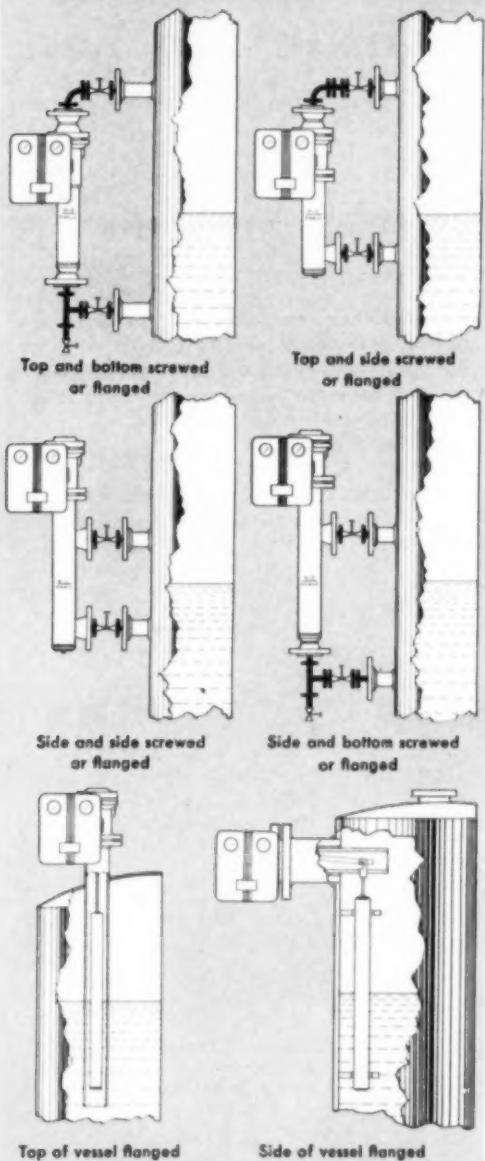


Left Hand Mounting Orientation

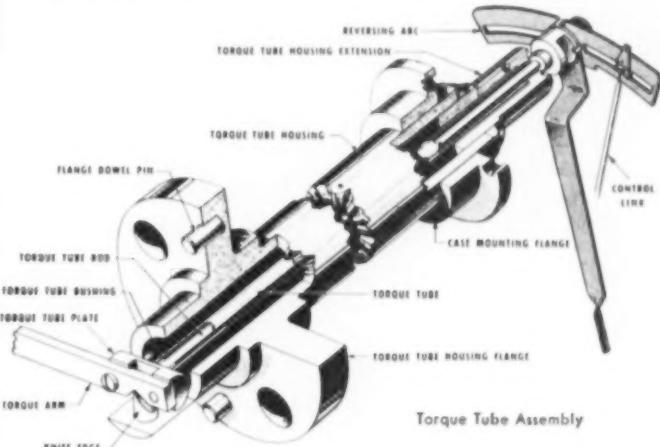
**OVER 1,000,000**

# LIQUID LEVEL CONTROLLERS and Install

## 10 TYPES MOUNTING CONNECTIONS A type to meet requirements of any vessel



Save time — save money! Masoneilan 12000 Series offers widest scope of selection plus design features that permit installation without delay and cost of precise preliminary layout. Convertibility *in the field* — of type of control and of orientation of instrument position to displacer and to chamber connections simplifies selection and installation. Simplified dimension schedule further assists in installation plans.



## 9 TORQUE TUBE MATERIALS

Inconel (standard), K-Monel, Monel, Type 316 Stainless Steel, Hastelloy B or C, Nickel, Phosphor Bronze, Durimet 20.

## CHAMBER or FLANGE MATERIALS

Iron, Bronze, Carbon Steel or various\* Alloys available on some chamber or flange types — carbon steel or alloys on all types  
\*e.g. Stainless Steel, Monel, Nickel, Hastelloy, etc.

## 8 STANDARD RANGES

14", 32", 48", 60", 72", 84", 96", 120"  
Special ranges available



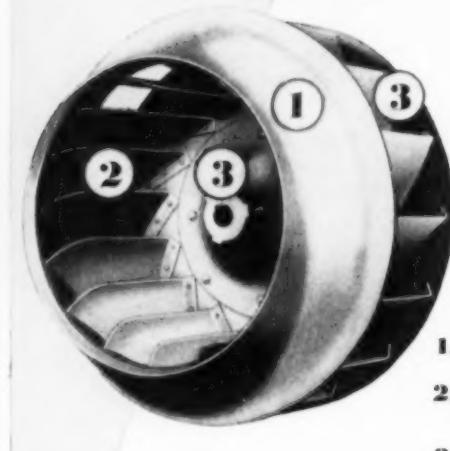
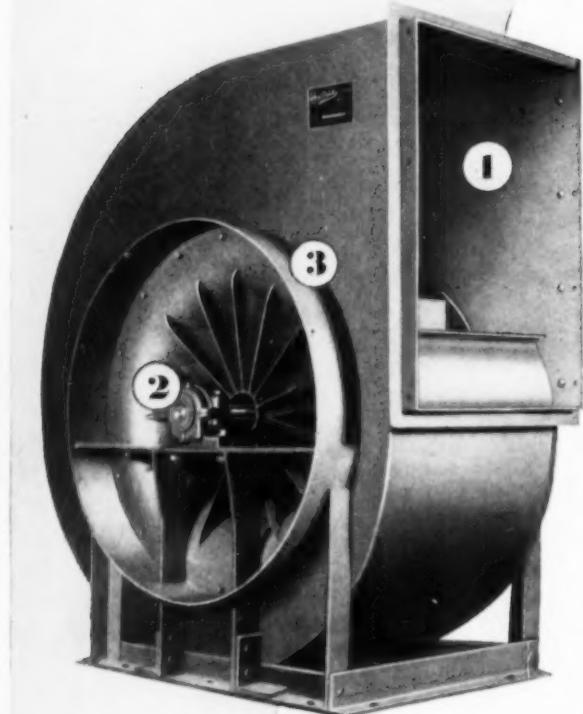
**MASON-NEILAN  
REGULATOR CO.**

1206 Adams St., Boston 24, Mass., U. S. A.

## POSSIBLE COMBINATIONS

**COMPLETE FAN**

1. Streamlined housing with outlet designed for most efficient air delivery.
2. Anti-friction or sleeve bearings to suit job requirements.
3. Ample inlet collar for easy connection to ductwork.



# NEW!

**"Buffalo" TYPE "BL"**  
**Limit-Load**  
REG. U.S.  
PAT. OFF.  
**Ventilating Fan**

In our seventy-six years of fan manufacturing, no fan has been more respected for fine performance than the "Buffalo" Type "LL" Ventilating Fan. This fine performance is now further improved in the new "Buffalo" Type "BL" Limit-Load Fan — designed especially for general ventilation, air conditioning and industrial service.

This new fan offers: (1) High efficiency; (2) Minimum noise level, over wide capacity range; (3) Full Limit-Load horsepower characteristic; (4) Stable performance from shut-off to free delivery.

Retaining the husky construction which has characterized "Buffalo" fans for many years, the new Type "BL" has some outstanding quality design features.

The Type "BL" fan will be built in standard sizes and arrangements with rotor diameters from 12½" to 108¾", to handle from 1,000 to 500,000 cfm.

You will want this superbly-performing new fan with the "Q" Factor\* on your next job! Write for new Bulletin F-100, which contains complete engineering details, including performance tables and dimensions.

\* The "Q" Factor — The built-in Quality which provides trouble-free satisfaction and long life.

## BUFFALO FORGE COMPANY

530 BROADWAY

BUFFALO, NEW YORK

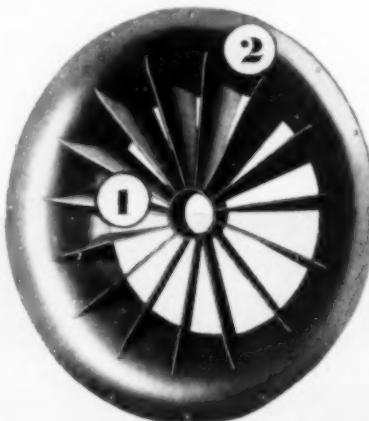
Publishers of "Fan Engineering" Handbook

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

### WHEEL

1. Heavy gauge die-formed shroud full curvature for proper air flow in wheel.
2. Die-formed blades curved and backwardly inclined for stable air flow. Welded and riveted for maximum strength.
3. Solid back plate with extra heavy hub.



### INLET

1. Furnished as standard, and exclusive with "Buffalo", these stationary inlet vanes reduce turbulence and assure rated air delivery in spite of unfavorable inlet conditions.
2. Die-formed inlet bell matches wheel shroud.

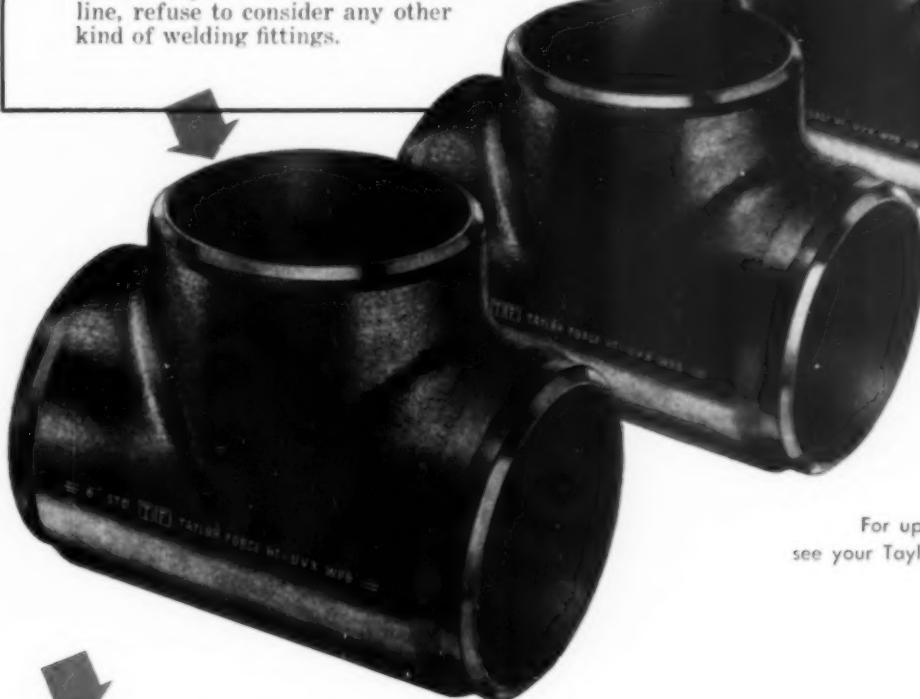
## *The fittings that revolutionized pipe welding . . .*

In the year 1931 Taylor Forge gave industry its *first real line* of seamless, butt-welding pipe fittings. We say it was the first *real line* because it was the first to include not only long and short radius ell's, but also full branch and reducing tees, concentric and eccentric reducers, stub ends, caps and welding neck flanges.

This was a fully planned development. Many years before Taylor Forge had foreseen the future of the butt-welding fitting . . . had realized that pipe welding could not go beyond its then crude stage until pipe users were given *all* the fittings necessary to make up complete piping systems.

So Taylor Forge went to work on this and after long research and development came out with the full line that became the inspiration of modern pipe welding.

Naturally the organization that started ahead has kept ahead . . . in design, in quality, in breadth of line. That is why so many men who have followed the development of the WeldELL line, refuse to consider any other kind of welding fittings.



T F

For up-to-the-minute facts,  
see your Taylor Forge distributor

# TAYLOR FORGE

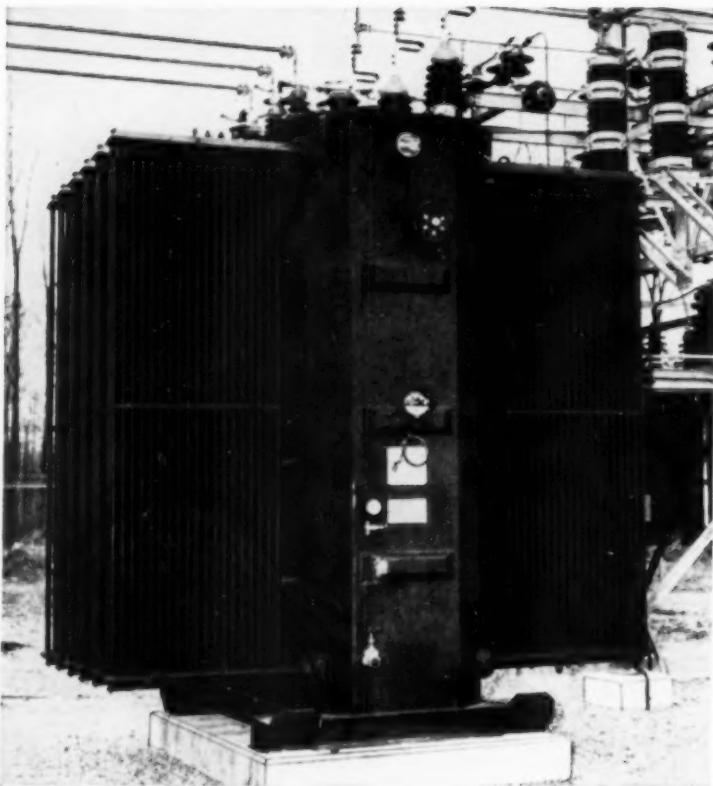
TAYLOR FORGE & PIPE WORKS, General Offices and Works: P.O. Box 485, Chicago 90, Ill.  
Offices in all principal cities. Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada

# **Wagner**

## **Transformers used by Studebaker in new power distribution system planned for present and future needs**



1000 KVA WAGNER UNIT SUBSTATION TRANSFORMER, at one of the five load centers that deliver 440 volt, three phase power to large machines and equipment.



6000 KVA WAGNER POWER TRANSFORMER where power is received at 26.4 kv and is stepped down to 13.2 kv for distribution to the seven unit substations in the plant.

### **New Jersey plant can convert from military to auto assembly production without extensive system changes!**

The modern power distribution system at the Studebaker Corporation plant at New Brunswick, New Jersey has been planned with an eye to the future. While the plant is now manufacturing military jet engine parts, it will eventually become eastern auto assembly headquarters for Studebaker.

The power load is divided between seven load center substations, all equipped with Wagner Unit Substation Transformers, spaced 160 feet apart down the center of the building. In addition to insuring an adequate power supply for present purposes, this plan provides a dependable supply of power from short secondary feeders at any time in the future. \* \* \*

Why not discuss your next transformer installation with the Wagner engineer nearest you? There are Wagner branches in 32 principal cities. Bulletin TU-181 gives full information on Wagner Power Transformers, and Bulletins TU-13 and TU-56 tell about Wagner Unit Substation Transformers. Write for your copies.

**WAGNER ELECTRIC CORPORATION**  
6383 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES.  
AUTOMOTIVE BRAKE SYSTEMS • AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

# We are known by the customers we ~~keep~~

Year after year, since 1904, we have been serving outstanding industries and institutions from coast to coast and in many foreign countries.

Adaptability to their maintenance problems and dependability have made our organization the leader in this field.

The fact that our customers continue with us year after year proves that they recognize the unusual values of our products and services.

Write today for free technical information on  
any of these guaranteed PEROLIN PRODUCTS:

- Algae Preventive
- Rapid Cleaner
- Condenser Treatment
- Boiler Treatments
- Soot Remover
- Tank Coating
- Brine Treatment
- Drain Cleaner
- Feed Water Treatment
- Fuel Oil Treatment
- Humidifier Treatment
- Water System Treatment
- Diesel Fuel Oil Treatment
- Steam and Return Line Treatment



*The PEROLIN COMPANY, Inc.*

Manufacturing Chemists since 1904

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22 WAREHOUSES IN THE U.S. AND CANADA



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## THE APPROVED AND SPECIFIED BACKING RINGS FOR WELDING PIPE, VALVE AND FITTING JOINTS

A 100% EFFICIENT WELDED JOINT. PRODUCES A PERFECT X-RAY,  
RADIOGRAPH OR GAMMA RAY PICTURE FOR  
HIGH TEMPERATURE SERVICES

ROBVON "C-NUB" is the PRODUCTION BACKING RING for economical welding procedure. ASSURES positive penetration and fusion.

ROBVON "C-NUB" engineered-concavity allows root-of-weld shrinkage eliminating ring-edge curl and crevice-pocket openings. ROBVON "C-NUB" controls WELD MASS preventing icicles.

ROBVON "C-NUB" conforms to NAVY DEPARTMENT BUREAU OF SHIPS TYPE PLAN 5000-S4800-64491-Alt. 1 and is approved by USCG, USMC, AWS, PFI, ABS and other Government Agencies.

IRON PIPE AND SPIRAL-WELD PIPE AND TUBE SIZES  $\frac{3}{4}$ " to 60"

"NUB" Spacer Root Openings are  $\frac{1}{8}$ ",  $\frac{3}{16}$ " and  $\frac{1}{4}$ "

ROBVON furnishes 5° and 10° TAPERED Backing Rings in all metals and dimensions.

ROBVON IS THE ONLY MANUFACTURER OF THE "C-NUB" TYPE BACKING RING

"C-NUB" and TAPERED in SPLIT or FABRICATED (inert-arc) SOLID

"Inert-arc Technique"—w/Argon gas  
Carbon (.08) A106  
1% ChrMo WP12  
4-6% ChrMo WP5  
3S-H14 Aluminum  
18-8 Stainless (Type 347Cb)  
Inconel X, Monel, Incoloy, Alloy  
Stainless and other metals.

An economic saving in materials, the ROBVON "C-NUB" BACKING RING SAVES more than 50% fit-up preparation — REDUCES initial maintenance and replacement costs.

ROBVON "C-NUB" BACKING RINGS are CATALOGUED—STOCKED—SOLD by leading Pipe, Valve and Fitting Manufacturers and through their branches, distributors and jobbers. "STANDARDIZED" by TOP-SIDE Fabricators, Designers, Consultants, Utilities, Shipbuilders, Refiners, Industrials, Chemicals, Textiles, Boiler and Turbine Manufacturers and other diversified Users.

## ROBVON BACKING RING COMPANY

Subsidiary of Robvon Industries Incorporated

GENERAL OFFICES

675 GARDEN ST., ELIZABETH, N. J.

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IVAN S. FORDE, JR., Sales Manager

# BIG NEWS

**About Boiler Blow-off**

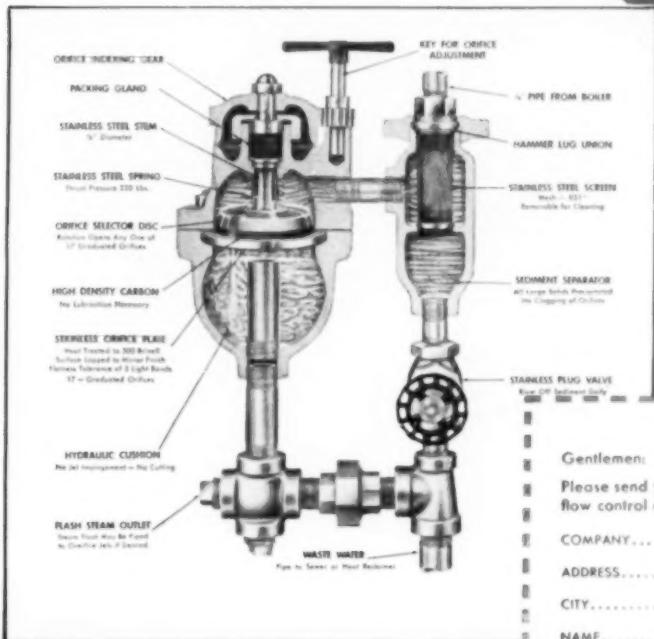
It seems strange that there should still be so much misinformation about such an important subject as boiler blow-off. Yet the facts are these: In many plants boiler blow-off remains a hit-or-miss proposition; too often it's just a choice between inadequate results or unnecessary waste of water and heat units.

Now a new fact has entered the picture. Now every plant can have precise, dollar-saving, continuous control of boiler blow-off, with the new Madden Orifice Meter.

On the one hand the new Madden Orifice Meter assures safe removal of impurities to avoid wet steam or priming. It never forgets, never guesses, never fails—yet can be instantly adapted for changing conditions. It saves expensive heat units wasted by excessive blow-off. Probably no other equipment in the boiler room can so quickly save its own cost.

Operating principles of the new Madden Orifice Meter have been proved in thousands of installations in leading boiler plants over the past 15 years. Suitable for every type and size of boiler and every water condition. Write for new catalog which has all the facts.

THE MADDEN CORP., 1543 Morse Ave., Chicago 26, Ill.



- ✓ Drains from the area of maximum concentration — for maximum effect
- ✓ Blows a pin hole stream continuously — to keep up with the continuous accumulation of impurities
- ✓ Controls precisely — choose the correct flow rate for your boiler, 17 orifices sized for your requirements
- ✓ Stays accurate — orifices are actually guaranteed against any distortion for 10 years.

Get complete engineering data  
and details of operation →

THE MADDEN CORP., 1543 Morse Ave., Chicago 26, Ill.

Gentlemen:

Please send your new catalog with full facts about the new Madden Orifice Meter flow control unit for boiler blow-off.

COMPANY.....

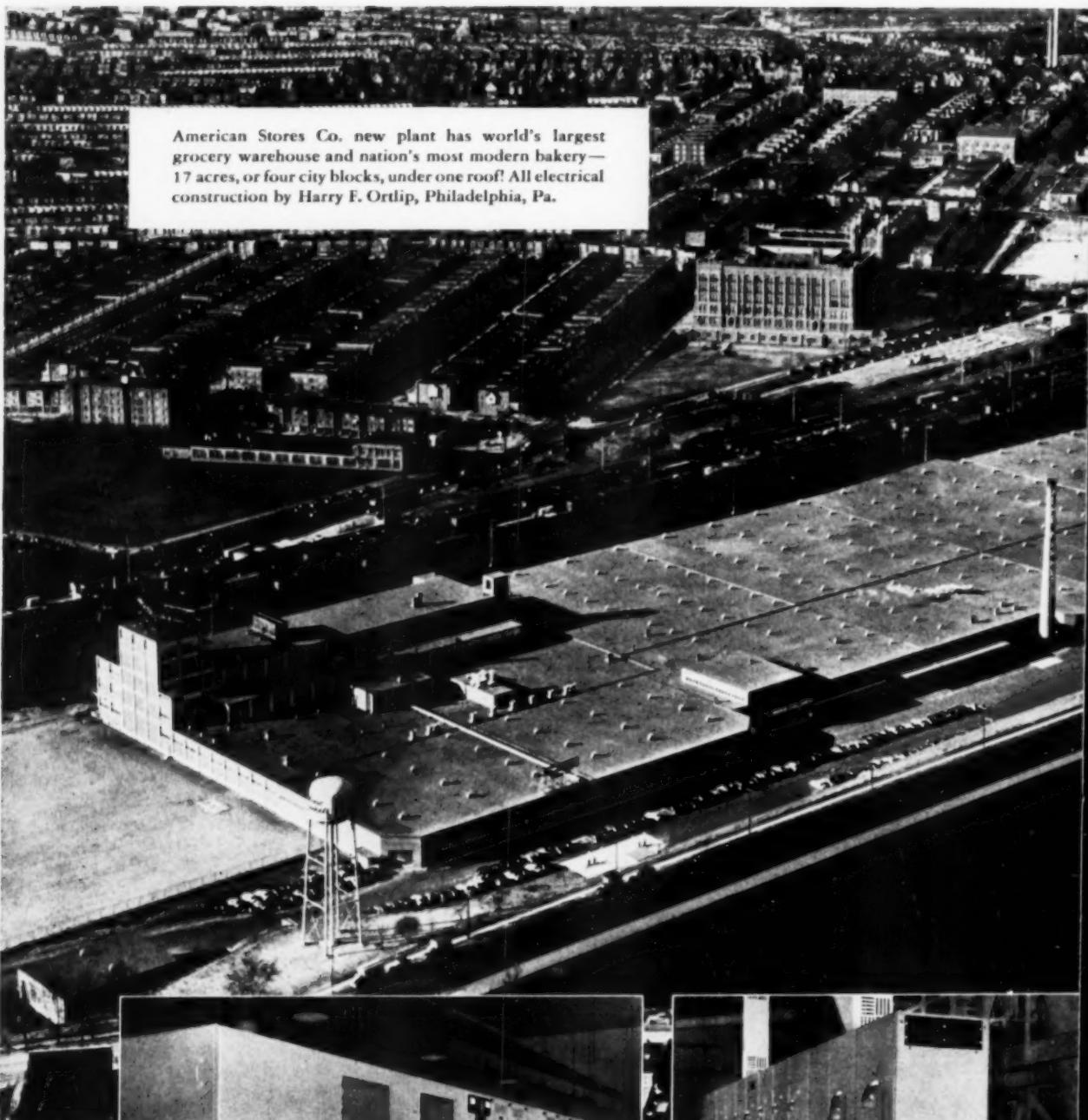
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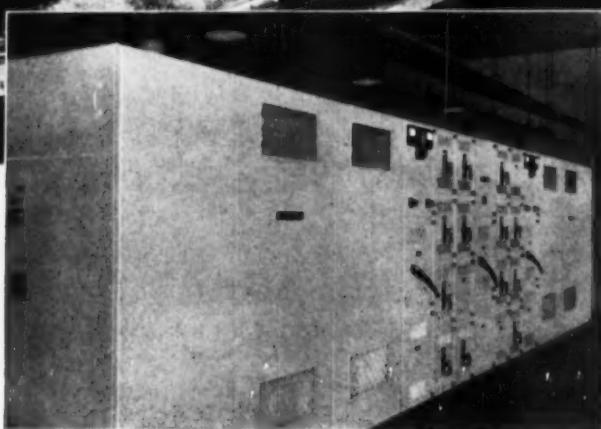
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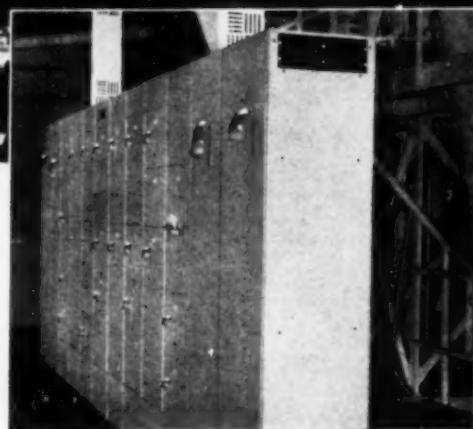
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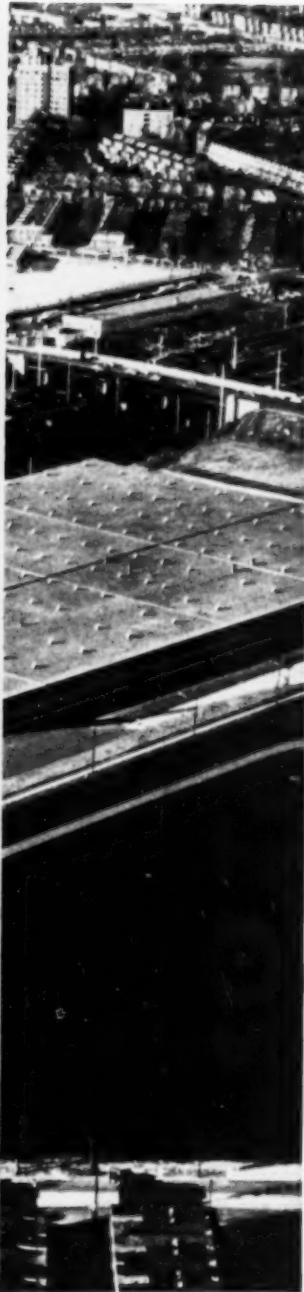
American Stores Co. new plant has world's largest grocery warehouse and nation's most modern bakery—17 acres, or four city blocks, under one roof! All electrical construction by Harry F. Ortlip, Philadelphia, Pa.



Westinghouse 2000 kva Double-Ended Indoor Power Center is one of three located in the bakery where loads are particularly heavy and concentrated.



Westinghouse Type Control Center is compact . . . centralizes control. Starters are mounted back-to-back to save space in the bakery control room.



## Excellent service continuity assured by dual, low-cost power system

An interesting power distribution problem resulted when American Stores Company planned its huge grocery warehouse and automatic bakery at Philadelphia, Pa. There, as a supply center for several hundred retail outlets, vast materials handling and food processing activities would be required. Both demanded highly reliable electrical service, at minimum cost.

Working closely with Ganteaume & McMullen, Engineers-Architects, of Boston, Mass., Westinghouse engineers helped adapt a secondary selective radial distribution system.

In the bakery, where continuous operation is exceedingly vital, the system supplies each load center over two primary feeders and through duplicate transformers. Thus, failure of one feeder cable or transformer permits immediate transfer of load to another feeder and transformer. Excellent service continuity is assured.

A lesser degree of continuity is required in the warehouse. Here, a bus tie feeder is located between two substations. It permits a limited amount of power to be made available to the other switchgear should one substation fail.

Westinghouse unitized equipment helped reduce power distribution costs. Use of five Westinghouse Power Centers enabled American Stores to bring high voltage close to the loads. Lower copper losses and minimum voltage drop resulted. Too, short secondary runs saved a considerable amount of copper. Improved voltage at the load was assured; losses were minimized.

Whether you are involved in a new construction project or plant modernization program, Westinghouse offers you the same assistance. Our engineers are ready to help you and your engineers plan a modern distribution system . . . and match it with a complete line of well engineered equipment.

For full details, call your nearest Westinghouse Office. Or write direct to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-94007

YOU CAN BE SURE...IF IT'S  
**Westinghouse**

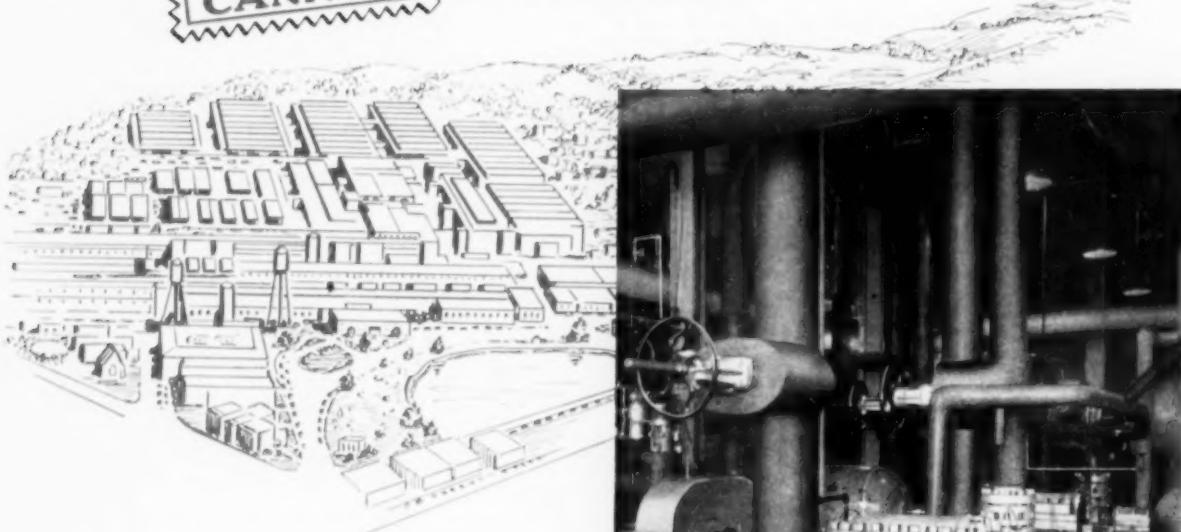
# HMTA PUMPS

## feed new high pressure boiler

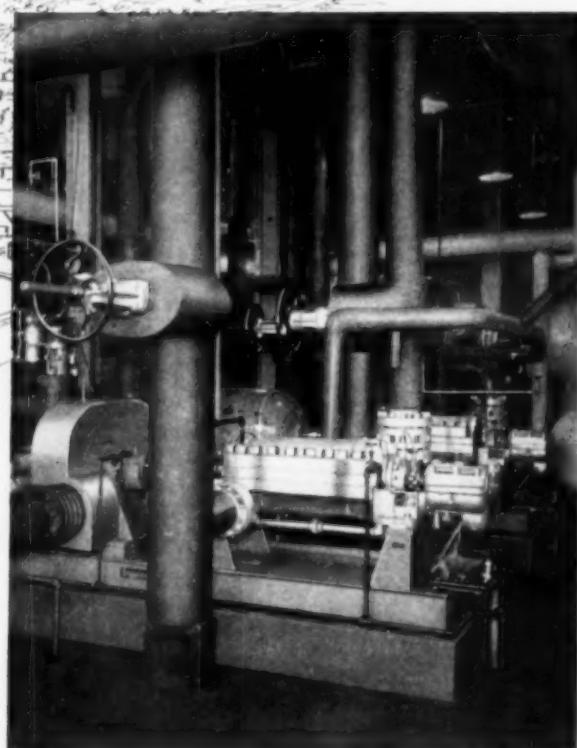
at



## mills plant



*Expansion program at  
world famous textile mill  
includes installation of  
newest design boiler  
feed pumps*



Cannon Mills main plant at Kannapolis, N. C.—home of world famous linens and toweling—has been expanding steadily for the past three years. To meet its increased power needs, an additional 7500 kw turbine was put on line about a year ago.

Ingersoll-Rand Class HMTA boiler feed pumps were selected to serve this completely modern generating unit. The installation, shown above, includes two four-inch, 6-stage high pressure pumps, each capable of delivering 700 gallons per minute at 1700 feet total head. The main feed pump shown in fore-

ground, is driven by a 400 hp steam turbine, while the duplicate standby unit has electric motor drive. These HMTA pumps, with I-R Unit-Type rotor assemblies, assure maximum continuity of service at sustained high efficiency and permit substantial savings in maintenance and inspection costs.

Ingersoll-Rand offers you a complete line of advanced design centrifugal pumps in types and sizes to meet every power plant and industrial requirement. Your nearest I-R representative will be glad to give you complete information.

COMPRESSORS • DIESELS • PUMPS  
AIR AND ELECTRIC TOOLS  
GAS ENGINES • ROCK DRILLS  
CONDENSERS • VACUUM EQUIPMENT



# Ingersoll-Rand

Cameron Pump Division  
11 Broadway, New York 4, N. Y.

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millions of people



## depend upon LIMITORQUES

For light, heat, refrigeration, radio, movies and countless other domestically enjoyed electric applications . . . millions depend upon reliable LimiTorque valve operation. This also applies to the vast number of electric motors and other devices used in our industrial system. Then, too, for the Oil, Gasoline, Gas and Water they consume . . . these same millions rely upon LimiTorque to accurately and dependably open and close valves, day and night.

Yes, LimiTorque is by far the most widely used Motorized Valve Operator in the world. It starts, stops and reverses at the mere push of a button . . . and, it protects valve stems, seats and discs from any possible damage in closing.



SERVING SOUTHERN INDUSTRY from LYNCHBURG, VA.

For catalogs or detailed information, write Virginia Gear and Machinery Corp., Lynchburg, Va. or the address below

# Philadelphia Gear Works, Inc.



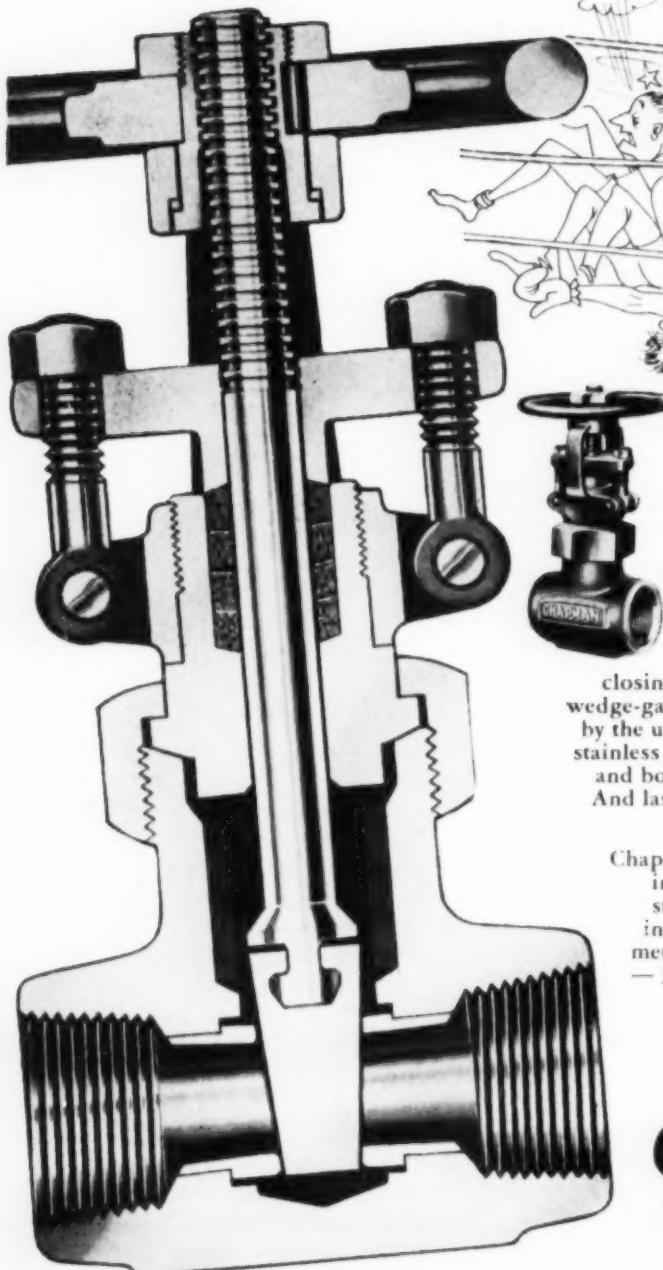
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Industrial Gears and Speed Reducers  
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**CHAPMAN LIST 960**

# Holds More Titles...

**than any valve of its kind**



Yes, here's the champ of all small forged steel gate valves! It has licked more different jobs than you can shake a stick at . . . and stays in there fighting with all the *extra stamina* you get in every Chapman Valve.

*Here are the reasons why:* Extra protection against even unusual stress when opening and closing the valve is provided by extra-strong stem-and-wedge-gate connection. Repairs and replacements are cut by the use of super-hardened seat rings and gate faces of stainless steel. Forged body and yoke are longer-lived . . . and bolted follower has no threads on yoke to corrode. And lastly, gate faces won't seize or gall because they're

*Malcomized* (Chapman patent) to 800 Brinell.

Chapman List 960 Forged Steel Gate Valves are made in sizes from  $\frac{1}{2}$ " to 2" inclusive . . . with rising stem with yoke (shown) or with rising stem with inside screw. Bonnet joints are either gasketed or metal to metal. Pressure range: 2,000 lb. at 100° F. — 380 lb. at 1,000° F. For higher pressures, specify List 990. And for full details on List 960, send today for your copy of Catalog 10.

**THE  
CHAPMAN  
VALVE MFG. CO.**

INDIAN ORCHARD, MASS.

SOUTHERN POWER & INDUSTRY for OCTOBER, 1953

# Timely Comments



## BETTER PRODUCTION . . . Now or Later?

ALL PLANTS have their barriers against progress. Stone walls, they are sometimes called—or maybe “iron curtains” in modern times. But call them what you choose—the man who is trying to do things and make improvements always meets a certain amount of resistance.

Here are a few of the commonly encountered blocks that the plant engineer must get past in order to keep things going with best overall economy. And here also are a few suggestions for sidestepping obstructions.

**Budgets:** “It’s not in the budget, so it can’t be done.” First of all, if it needs doing it probably should have been in the budget—in ample time, and with sufficient sales argument to make it stick. But there is always such a thing as emergency appropriations. Ask for it now and show how much will be lost by waiting until next year. Anyway a sound request now will assure an appropriation in next year’s budget.

**Scarce Materials:** There was much truth in the statement of an engineer soon after World War II when he said, “I haven’t run into anything yet that you can’t buy if you have the money and are willing to spend it.”

**Can’t Shut Down:** Nearly every plant shuts down for the Fourth of July and Christmas, and most of them much more frequently. The important thing is to be ready with equipment and plans when the right time comes. Much can be done during a short outage—and many important improvements can be made with no outage. It all adds up to advance planning and thorough preparation.

**Costs Too Much:** “We can’t afford to do it” may well be changed to, “We can’t afford to do without it,” in the case of most small economy measures that are put off from month to month.

**Beyond Our Skill:** Certainly there are some jobs that are too specialized to justify keeping experts on the payroll for occasional need. But nearly always 90% of the work is plain mechanical and electrical. Breaking the tough assignment down into its own elements will highlight the tough spots and show just what requires outside help. More and more contract specialists are becoming available for plant work. And frequently a larger plant in the area can furnish the skill needed by a small neighbor for an occasional special job.

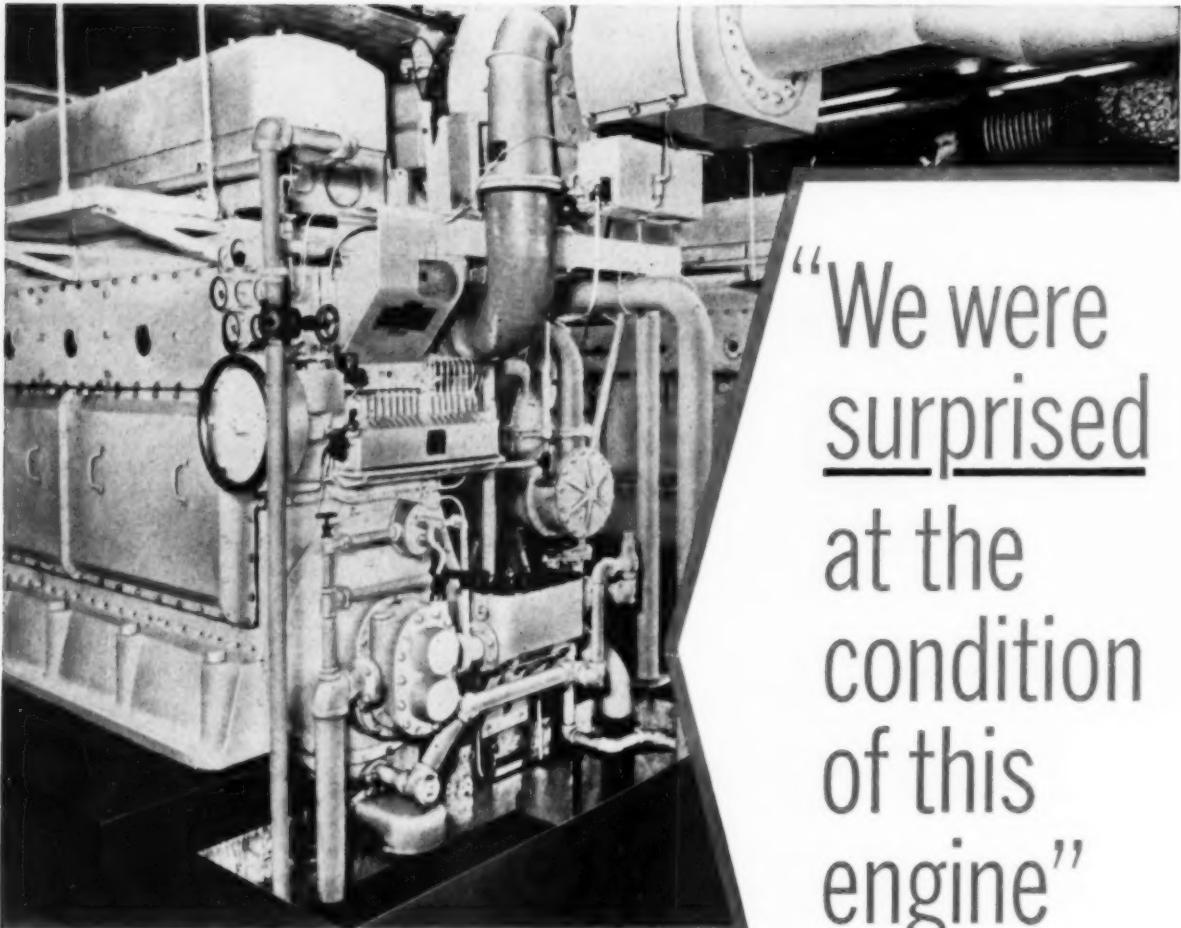
**Too Hot:** Where the area is too hot for men to work, something can usually be done about it. Go talk to a topnotch boiler repair man. He will have some good ideas. But watch that safety angle. No job is important enough to risk a workman’s life.

**Modernization:** Putting off everything until complete modernization can be very expensive, because the big program may be put off also. Normally, if a plant is going to be operated at all, reasonably good maintenance and modest improvements will pay off. Deciding what is best to do in such cases demands real intelligence—and usually a bit of extra effort.

**Can’t Get O.K.:** Show the owner just what is being lost each month. Talk right to his pocket-book. Plant owners all like money.

**Not My Department:** That can be true. But nearly always, if you know about it, it must have some effect on your department. Go to the right department head and lay your cards on the table. Show him how he can be a big shot. Let him take all the credit. All you want in this case is to get the job done so your own shoes will quit pinching.

**Too Busy:** If we were to comment on this freely, some of our readers might cancel their subscriptions.



“We were  
surprised  
at the  
condition  
of this  
engine”

... says G. V. Yarger,  
Supt. Municipal Utilities  
Waverly, Iowa

“When we finally opened up our Worthington, it was in the *best* condition I've ever seen a diesel engine that had operated such long hours and under such heavy loads as this unit. It had a total of 48,926 hours on it — 8,987 hours of tough operation since the last overhaul.

Mr. Yarger continues, “We've been using Sinclair RUBILENE® Heavy in the crankcase and RUBILENE H.D. 30 in the cylinder lubricator.

These RUBILENES have kept the crankcase and upper portions of the cylinders exceptionally clean and bright, with no sign of carbon or deposits.”

That's a typical report on the exceptional qualities of the Sinclair RUBILENES . . . evidence that they could improve the efficiency of *your* diesels, too.

Why not switch now? Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

## SINCLAIR DIESEL OILS

save wear and replacements

# What it takes to make a 3000 Degree Refractory Concrete



Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

**Here are the answers to some of the most frequently asked questions:**

**Q. When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?**

**A.** No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.

**Q. Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?**

**A.** Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water

and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

**Q. Then you have a grog, a binder and a method of putting them together. Which is most important?**

**A.** You can't say that any one is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.

**Q. And now, what about the binder?**

**A.** There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the pre-

firing of the binder to produce stable compounds.

**Q. Just how important is the manufacturing or "blending" of the grog and the binder?**

**A.** If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, prefiring temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

**Q. These factors you've discussed must add up to some specific advantages of Kaocast. What are they?**

**A.** B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

THE BABCOCK & WILCOX CO.  
Refractories Division  
General Offices:  
161 East 42nd St., New York 17, N. Y.  
Works: Augusta, Ga.

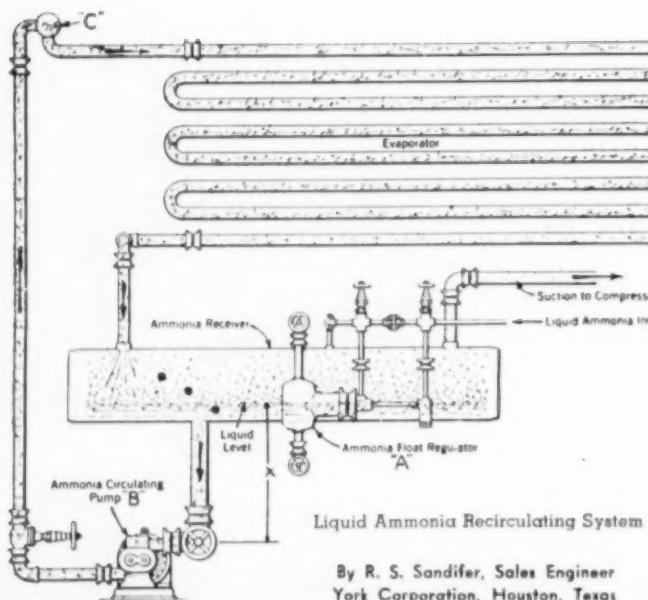
## Section 1

# Refrigeration and Air Conditioning

*Evaporators most efficient when flooded with refrigerant . . . temperature and humidity control . . . measuring air velocities . . . plant heats in winter and cools in summer with scrap sawdust operated units*

## Case I—Texas Packing Plant

## Refrigerating Plant Efficiency Improved With Liquid Ammonia Recirculating System



By R. S. Sandifer, Sales Engineer  
York Corporation, Houston, Texas

THE output of Burton Bros. Packing Co., Houston, Texas, had increased to the extent that the refrigeration plant was inadequate.

The refrigeration plant consisted of several slow speed ammonia compressors, condenser, receiver and wall type evaporator coils of  $1\frac{1}{4}$ " bare pipe. The coils were being fed through hand expansion valves.

A survey of the plant and calculation of the load indicated that the refrigeration equipment was adequate but that the efficiency was impaired by the use of the hand expansion valves.

When evaporators are fed by hand expansion valves or any type of expansion valve, a certain amount of the evaporator will contain "flash gas." This amounts to 15% to 20% and the efficiency of the evaporator is impaired accordingly. Evaporators are most efficient when they are completely filled or flooded with the refrigerant.

It is possible to flood an evaporator by using a low pressure receiver above the evaporator and allow refrigerant to flow by grav-

ity. In this particular installation, it was not convenient to locate the low pressure receiver above the evaporators so it was decided to locate the low pressure receiver in the machine room and circulate the refrigerant by means of liquid pumps.

#### How System Operates

The schematic diagram indicates the operation of the liquid ammonia recirculating system. A low pressure float regulator maintains the proper level of liquid in the low pressure receiver, from which it

flows by gravity to the suction side of the pump. The ammonia circulating pump "B" forces liquid up to the distributing header "C," then through the evaporator where it is partly evaporated. The distributing header "C" is equipped with orifice nipples designed to deliver an equal amount of liquid to each point of feed to the evaporator. The gas formed in the evaporator along with all remaining liquid, flows into the receiver.

The gas is then picked up by the compressor, and the excess liquid to which make-up liquid is added

by the float regulator is again circulated.

The pump supplies pre-cooled liquid ammonia to the cooling coils and the "flash gas" for self cooling of the liquid goes back to the compressor and never enters the evaporator coils, thus providing additional efficiency.

In this plant not only did the liquid recirculating system improve the efficiency to handle the increased load but two additional cooler rooms have since been added. The entire load is still handled with the existing compressor.

#### Case 2—Georgia Hosiery Mill

#### Nylon Spoilage Reduced 75%

TEMPERATURE and humidity have always presented serious production problems in the hosiery industry. These problems have become more acute with the introduction of complex, high-speed knitting equipment for the manufacture of nylon hose.

Nylon thread is coated with a wax base or sizing. If the air in a hosiery plant is too moist, the wax base sheds off and becomes sticky, causing the yarn to jerk and resulting in spoilage and imperfections. Dry air,

on the other hand, causes the yarn to become brittle, resulting in broken needles and costly machine down-time.

The Macon Hosiery Mills, Inc., of Macon, Ga., tried different types of equipment to control the temperature and humidity in its plant—everything from exhaust fans to heaters. But it did not find the complete solution to the problem until it installed a Servel air conditioning system, consisting of ten 5-ton refrigeration units powered by steam from a gas-fired boiler.

With the precision control provided by this Servel air conditioning equipment, down-time on machines has been held to the barest minimum, and nylon spoilage has been reduced 75%.

The constant temperature and humidity control also provides comfortable working conditions. Six of the ten 5-ton Servel absorption refrigeration units are shown at the right. Because there are no moving parts in the refrigeration system, this type of air conditioning installation is remarkably free from noise and vibration.



### Case 3—Louisiana

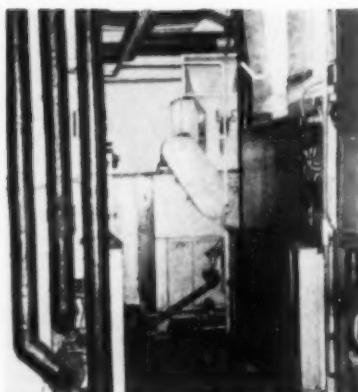
## Printing Plant Air Conditioned

THE Times Picayune Publishing Company, New Orleans, La., completely air conditioned its building to obtain maximum results with paper.

Paper is very sensitive to variations in the humidity of the surrounding air and to extreme conditions of humidity and temperature. These variations and extremes result in operating difficulties which interfere with production, and lower the qualities of the finished products to an extent that cannot be tolerated in a modern plant.

### Three Types of Equipment

Designed and installed by Airtemp Construction Corporation, the air conditioning installation here employs three different types



Typical machinery room of the air units on 2nd and 6th floors. Chrysler Airtemp equipment is employed by the Times Picayune Publishing Company.

of equipment: (1) "packaged" units, (2) direct expansion air handling units and (3) central water chilling system with air handling units. The three systems total 571 tons of air conditioning equipment.

Temperature and humidity are

controlled in the press room and paper storage room by four 75-ton Chrysler Airtemp water chilling units which supply necessary chilled water to nine air handling units. In the press room, the individual air handling units are stationed according to the heat loads produced by the various presses. This assures economic operations, for the conditioned air is supplied only where needed—depending upon which presses are in operation.

Fifteen direct expansion air handling units and Chrysler Airtemp compressors producing 240 tons of air conditioning hold the temperature and humidity constant on the second, third, fourth, fifth and sixth floors. This type of system allows independent control of each floor and is the best from the viewpoint of initial cost and operating expense.

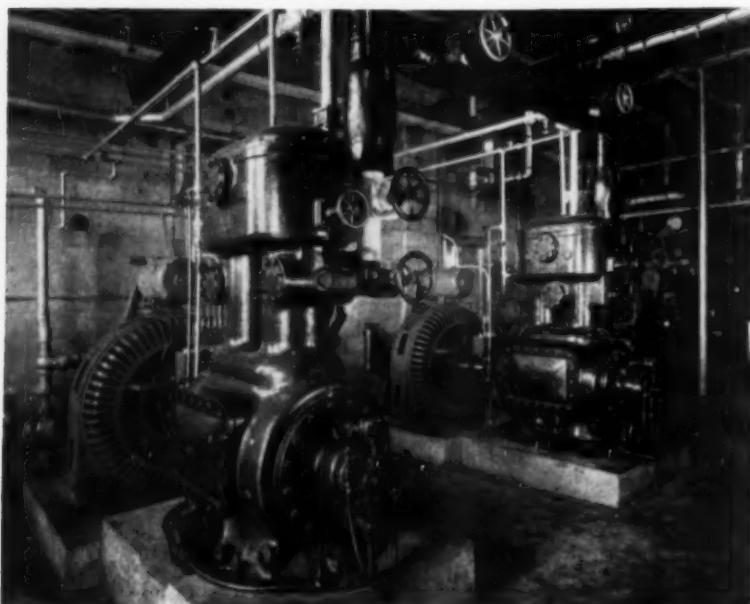
The first floor office space is comfort-zoned by Chrysler Airtemp "packaged" air conditioners.

### Case 4—Georgia Food Processing

## Refrigeration for Process Plant

A MODERN plant for manufacturing margarine and salad dressing is operated by Standard Brands in Atlanta, Georgia. Proc-

ess plants of this type always require considerable refrigeration. Two large Frick ammonia compressors are employed.



Two evaporative condensers, of special size 15,003, are used; they have galvanized housings, and are installed on the roof. The receiver is fitted with a purger.

Five ceiling-type air cooling units, equipped with thermal valves, are installed in the rooms. These have finned tubing and 3-way water valves for defrosting. Four of these units are installed in a storage room held at 35 degrees, while the fifth keeps the tempering room between 50 and 65.

In addition, an instant cooler chills 100 gpm of water from 58 to 50 degrees F. This cooler is 13 pipes wide and 4 pipes high, and is also galvanized.

Automatic controls include a high pressure cutout and alarm

Two large Frick ammonia compressors are installed in the Standard Brands' Atlanta, Georgia, plant. The 10 x 10 machine operates with a suction pressure of 30 lb gauge and the 9 x 9 with 12, when required. The large machine is driven at 360 rpm by a 125 hp motor. The 9 x 9 runs at 400 rpm and has a 100 hp motor. Both machines are equipped with capacity controls. Motors, manufactured by Ideal, have top-mounted exciters.

bell, room thermostats with adjustable settings for the storage and seasoning rooms,  $\frac{1}{2}$  in. electric control valves for the ammonia feed lines, and suction pressure regulating valves for each of the rooms.

#### Case 5—Virginia

#### Air-Meter Solves Balancing Problem

RECENTLY, a leading tobacco company developed an entirely new type of tobacco drying machine to handle its drying process with greatest efficiency.

It was imperative for the success of the new machine that air flow into each of the drying rooms be controlled exactly. Since 12 outlets are located in each of the eight drying rooms involved, the tobacco company was faced with the task of balancing air flow from 96 ducts.



The Hastings Standard Air-Meter (Hastings Instrument Company, Hampton, Virginia) measures air velocities from 0 to 6000 fpm.

In the drying process, proper air circulation plays as important a role as proper temperature control, according to the tobacco concern. Faulty circulation produces "still spots" (areas with little ventilation) while other locations are overly ventilated.

This company took its first step by purchasing a highly accurate instrument for measuring air velocities—the Hastings Standard Air-Meter.

After establishing the proper level of air flow, the company made

a careful air velocity check at each of the 96 ducts.

The Hastings instrument proved practical for measuring air flows in inaccessible areas because of its light weight (26 ounces) and the advantage it offered in allowing the

sensing element to be used some distance from the meter itself by employing an extension cable.

Through such inspections, the ventilation system for all eight drying rooms was ultimately brought into balance.

#### Case 6—Tennessee Manufacturing

#### Pencil Plant Operates Air Conditioning With Scrap Sawdust to Lick Bottleneck

HIGH humidity conditions presented a tough production bottleneck in the National Pencil Company plant at Shelbyville, Tenn. Damp, muggy days caused warping of the wood blocks from which pencils are cut, and almost tripled the number of lacquer coats required.

The management overcame this condition by installing Servel all-year air conditioning units, which provide complete year-round control over temperature and humidity. They heat in winter and cool in summer with the same equipment.

Because the Servel equipment is of the heat-actuated absorption type, the National Pencil Company has been able to burn scrap saw-

dust to create steam for its air conditioning system.

The management of the National Pencil Company has found that burning scrap sawdust in the steam generator for its all-year air conditioning system provides year-round control over temperature and humidity in its manufacturing process, and makes its plant a refreshingly comfortable place in which to work.

The system is made up of a series of seven 5-ton Servel units, each serving a different area of the plant, operated by steam from one central sawdust-fired boiler. The absorption refrigeration cycle used for summer cooling has no moving parts.

Every pencil produced by the National Pencil Company, Shelbyville, Tenn., is handled and inspected before it is packaged in this department. The company makes more than 300 different types of pencils. In the background is one of the 5-ton Servel "all-year" air conditioning units which provide closer quality control in production operations and make for greater employee comfort.



## Piping and Valves

### Section 2

*Aluminum saves on retubing project . . . reducing power requirements of rotary pressure joint . . . corrosive service . . . insulation technique . . . trap selection for steam jacketed vessels*

#### Case 7—Louisiana Refinery

##### Switch to Aluminum Saved \$50,000

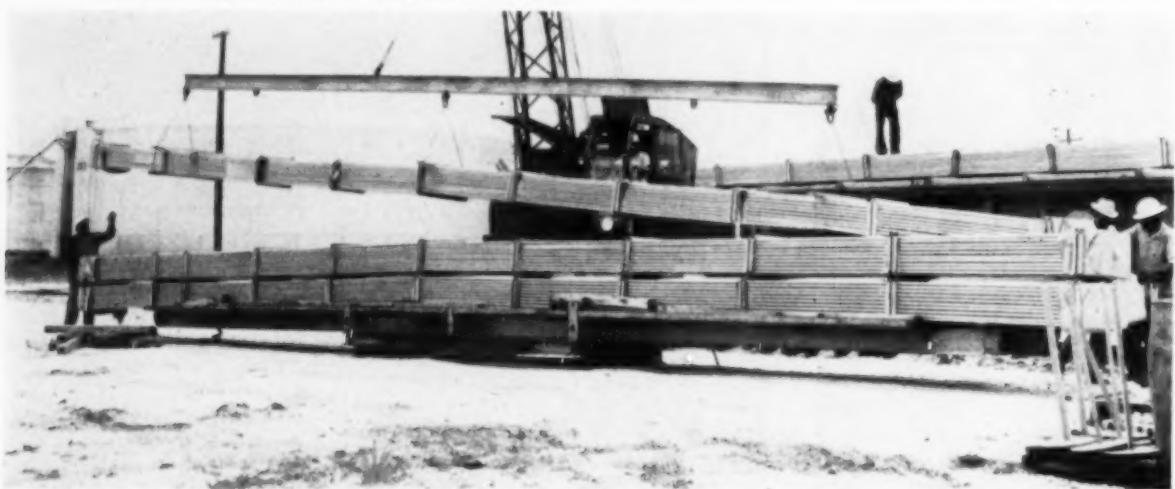
WILLINGNESS to consider a new approach to a piping application, team work of the engineers, and use of aluminum brought about an estimated saving of \$50,000 in the retubing of Esso Standard Oil Company's seven redesigned wax sweater units at its refinery in Baton Rouge, La.

Originally, it was planned that the wax sweepers (open, pan-type cooling units for removing wax from oils) would be retubed with coils fabricated from copper tubing and fittings. Esso's engineers had considered aluminum before, but had to drop the idea because techniques for producing suitable alumin-

ium fittings and welding the thin-walled tubes to fittings had not been developed. The Engineering Service Division of Tube Turns, Inc. and Alcoa's Development Division went to work on these problems and came up with the answer that saved Esso an estimated \$50,000 in material cost.

Alcoa developed a new aluminum brazing technique. It consists of joining the flared ends of the tubing to the fittings by brazing with a double-tipped oxy-hydrogen torch.

These aluminum coils, for Esso Standard Oil Company's redesigned wax sweater units, were fabricated with Tube-Turn fittings. Result: A saving of \$7000 per unit.



Fabrication time and labor were about the same as entailed previously when joining copper. In order to accommodate the brazing technique, Tube Turns, Inc. provided long radius 180° returns and 90° elbows with small tangents on each end.

For the retubing project, an aluminum alloy many times more corrosion resistant than the commonly

specified types was selected. This was Alclad 3S, which has a lining on the inside diameter of a different aluminum alloy than the outside metal. This internal cladding protects the tubing and fittings from corrosion by its own electrolytic action with the rest of the material.

Each of the wax sweater units required 900 Tube-Turn 180° re-

turns, 120 Tube-Turn 90° elbows, and approximately 58,000 ft of tubing. Both tubing and fittings were Alclad 3S-F aluminum alloy. The OD is 1 in. and the walls are .065 in.

The switch to aluminum saved about \$7,000 per unit. Also, the success of this project was timely considering the country's present short supply of copper.

#### Case 8—Virginia Paper Mill

### Compensator Reduces Power Requirements of Rotary Pressure Joint 60% or More

A VIRGINIA paper mill reports a great satisfaction with the installation of 119 Johnson Joints equipped with the Johnson Automatic Load Compensator. While the installation is too recent to have full data on its performance, it is expected that these Johnson Joints equipped with the new compensator will effect over 60% reduction in joint horsepower load as well as increase service life of the joint by reducing friction.

This new compensator takes the form of an attachment which is supported by the same rods that support the Type L Johnson Joint. It houses a flexible metal diaphragm and a heavy metal plunger. Pressure from inside the joint body

is sent through connecting tubing into the compensator body and against the plunger, which in turn acts against the joint body to unload some of the operating against the sealing member of the joint.

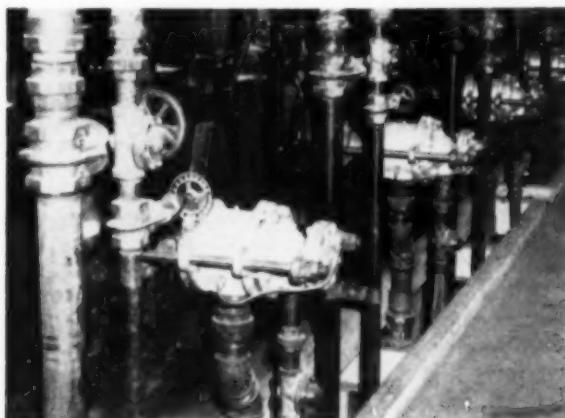
In addition to the power savings, the Johnson Compensator brings additional savings by extending seal ring life and reducing maintenance cost. For as the load on the seal rings is decreased, the wearing action on the seal rings is likewise decreased. With the advent of higher working pressures and higher speeds this becomes a factor of increasing importance. It can be expected that this mill's experience will be that the reduction in seal ring wear approximates the

reduction in power—that is, service life of the seal ring will be increased about three times due to the use of the Johnson Compensator.

The machine on which these Johnson Joints with Johnson Compensators have been installed is a new one. It has 92 paper dryers and 27 felt dryers. It runs at 1500 ft a minute, but can go up to 2500 ft a minute. The dryers have a face dimension of 272 in. and handle 250 in. in trim size of paper.

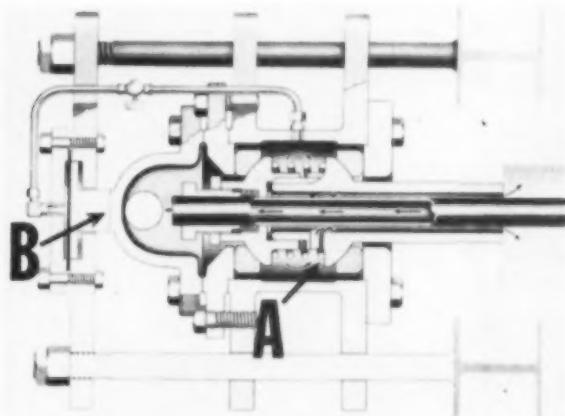
#### More Information Available

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A line of Johnson Corporation Rotary Pressure Joints with Johnson's new Automatic Load Compensator installed on a Virginia paper mill's machine which has 92 paper dryers and 27 felt dryers.

Diagram (right) shows the basic principle of operation. Pressure within the joint exerts a sealing force represented by "A". This same pressure is transmitted through the connecting tub-



ing to exert a force, represented by "B", against the joint body. The total pressure, or force, at "B" then offsets to a high percentage the total pressure, or force, at "A". Since both of these forces stem from the same operating pressure within the joint, the ratio between them remains a fixed constant. No matter how the operating pressure may vary, the seal will not be affected, and the power reduction will remain the same percentage.

## Case 9—Florida Paint Manufacturer

### Long Life Valves in Corrosive Service

**I**N Jacksonville, Florida, Raymond B. Harris, General Manager, and E. B. Loyless, Superintendent, of Jacksonville Processing Co., give credit to "Causul" metal for reducing initial cost and maintenance of valves serving wash tanks employed in processing raw pine gum.

Jacksonville Processing Co., a division of The Glidden Co., manufacturers of paint and kindred products, retained R. P. Newton, Jr., of the Applied Engineering Co., Orangeburg, S. C., to make an extensive study of the industry in 1938 and present his recommendations for plant design. The completed plant is the largest of its kind ever built. Newton had also been consultant for 20 plants in similar operations and in every case he recommended Lunkenheimer "Causul" metal valves. Seven of the original nine stainless steel wash tanks erected at Jacksonville in 1939 were equipped with Lunkenheimer "Causul" metal valves with monel trims. These

valves are still in operation, giving dependable and trouble-free service.

During World War II when it was difficult to obtain specific types of valves due to metal shortages, they were forced to turn to other types. In every instance, the company reported, it was proven that Lunkenheimer "Causul" metal valves gave far longer and more dependable service.

"Causul" metal is an austenitic cast iron, low in carbon, sulphur and phosphorous content. It provides all the resistance needed for the valve body and is combined with Monel and Type 316 stainless steel trim, where maximum corrosion resistance is necessary. The result is a product far less expensive than all-Monel and all-stainless steel valves and yet capable of successfully handling many of the corrosive fluids used throughout modern industry. "Causul" metal has a tensile strength of 33,000 psi, and its deflection characteristics are two to three times those of highest quality gray iron.

A cluster of nine Lunkenheimer "Causul" metal gate valves equipped with Monel trim were used on stainless steel tanks to handle filtered pine gum at The Jacksonville Processing Co., Jacksonville, Fla., where this valve proved capable of standing up under severe corrosive conditions and constant service.



## Case 10—Southwest

### Valve Insulation

**V**ALVE and fitting covers, shop fabricated from Calsilite molded pipe covering (Ruberoid Company) have been found by a Southwestern oil refinery to be sturdy and resistant to breakage in ordinary job handling. On comparative tests in the refinery's shop, the Calsilite was easier to fabricate and made better covers than many other materials because of its workability.

The Thermal Products Company, Ruberoid's distributor in Houston, Texas, emphasizes that the Calsilite is cleanly and accurately cut on a power driven band saw, and the elements of the insulation cover are readily cemented together using ordinary sodium silicate for the adhesive. The finished cover is neat in appearance and easily applied because of its sturdiness.

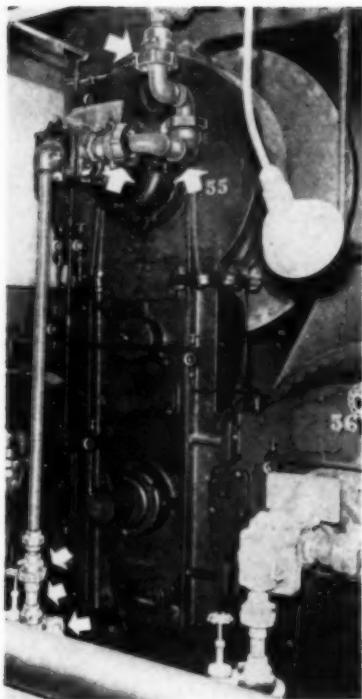
## Case 11—Florida Paper Mill

### Ball Joints on Paper Dryers

**T**HE accompanying photograph, taken in a Florida paper mill, shows how Barco Manufacturing Co. ball joints are being used to make trouble-free piping connections.

By using three ball joints in any piping connection, any conceivable movement can be accommodated—this cannot be done with two joints as many people think. As gaskets in the ball joints wear, a leak will appear which can be promptly taken care of by tightening the adjustable nut, thus eliminating the blow-out hazard and avoiding shutting down the dryer roll.

The primary reason for the use of Barco Ball Joints in place of the flexible metal hose formerly used is from a safety standpoint. The Ball Joints will not blow out and are able to take movement in all directions without damage as well as providing long service-free life. Their use is increasingly important as higher steam pressures are used on dryers. For example, in



Barco ball joints on Florida paper mill dryer.

this Florida paper mill installation they are used on the hot end where the steam pressure is approximately 160 psi.

#### Case 12—Alabama Foundry

### New Heating System For Pipe Tar Bath

A MODERN system for tar-coating cast iron soil pipe is employed by the Rudisill Foundry Company of Anniston, Alabama. It is a continuous dipping system using a heated tar bath to give a coating superior to that produced where pipes are heated and then dipped. With the new system, pipes cannot be overheated in the heated bath, and just enough heat for quick drying is retained.

Originally the heating system for this tar bath employed four banks of pipe coils, trapped by old type traps. Production was hindered by a variety of troubles, not the least of which was the time required to bring the bath up to operating temperature.

For instance, at the north end of the vat it took 4 hours and 45 min.

to effect a 30 degree temperature rise.

Then they installed a new heating system — Platecoils equipped with 36 Yarway Impulse Steam Traps, and now they are having no difficulty getting and maintaining the temperature they need. At the same north end position, temperature charts show they get approximately the same 30 degree temperature rise in only 3 hours and 10 min.

Most important is the fact that they have now been able to step up their casting tonnage from 90 tons per 8 hours to 125 tons per 8 hours . . . and the coating vat is now carrying about 35% additional load.



Tar bath in the Rudisill Foundry Company, Anniston, Alabama. New heating system features Platecoils equipped with 36 Yarway (Yarnall-Waring Company) Impulse Steam Traps. Note traps on either side of the vat.

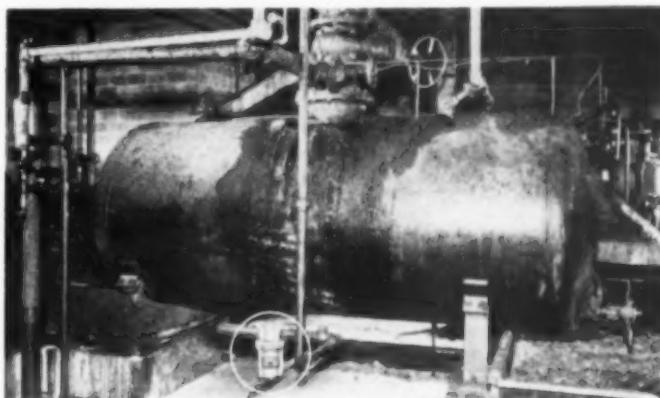
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#### Case 13

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### Traps for Steam Jacketed Vessels

The engineer of a Southern rendering plant emphasizes dependability as an absolute necessity in choice of traps for his steam jacketed vessels. Choice of the right trap for the particular service is especially important here because the steam compartment of the vessel is filled with air before the steam is turned on, and the different rates of speed with which various traps remove air influences the heating up period of the vessel. Also the arrangement of equipment must be such that repairs may be easily and quickly accomplished.



While the Super-Silvertop trap made by V. D. Anderson, shown in the accompanying photograph, has been in continuous service in this rendering plant for seven years without need for repairs, both the trap design and method of installation assure ease of servicing when necessary. Note that the trap is installed straight-in-line. To inspect the trap, the mechanic merely needs to loosen the head bolts and slip off the body, which exposes the interior. Then, he can renew any or all working parts in a few minutes.

## Materials Handling

### Section 3

*Unitized shipping system . . . log conveyor system . . . wire mesh belts in freezing tunnels . . . conveyor helps classify materials . . . bulk material movement . . . chemical unloading by conveyor . . . automatic transfer between buildings . . . production with Tramrail*



Clay is now dug with an Allis-Chalmers HD-20 4-yard front end loader. This is more mobile than the shovel it replaced; can fill a truck in one load, where the shovel required two. Expensive drilling is eliminated. A fixed track, which had to be moved frequently, was formerly used.

#### Case 14—North Carolina Brick and Tile Plant

#### Clay Handling Modernized From Pit to Storage Bin

BEFORE undertaking a modernization of their clay digging, grinding, and storage facilities last year, Borden Brick and Tile Co.,

Durham, N. C., was faced with the problem of a production capacity inadequate to take care of their expanding business. Clay digging,

(1) From the pit, clay is taken to the crushing room, where it is fed by a reciprocating feeder (J. C. Steele and Sons, Inc., Statesville, N. C.) to this Meco 36-in. single roll crusher (Manufacturer's Equipment Co.). Clay is reduced from large lumps to pieces of about 4 in. maximum size. Same crusher was used before, but was rebuilt and equipped with individual drive.

(2) Tub feeder, made in Borden's own machine shop, feeds the crushed clay uniformly onto a belt conveyor (Continental Gin Co., Birmingham, Ala.) for transportation to the grinding room. One

materials handling, and grinding equipment were antiquated, and no storing and mixing bins of any size were available. As a result, production was low, costs were high, and material was often not properly prepared to maintain a uniform product.

The illustrations show how Borden modernized its handling of clay from the pit to the storage bin, and so was able to more than double its production, improve the quality of its product, and reduce operating costs.



man operates the crushing room where two were previously required. A conveyor from crushing room to grinding room (right) replaces bucket elevator used when crushing and grinding were on two floors of the same building.

(3) Clay is first fed in the grinding room to a 6A Disintegrator (J. C. Steele and Sons, Inc.), which reduces it to a maximum size of  $\frac{1}{2}$  in.

(4) A vibrating 4' x 8' screen (Simplicity Screen Co.),  $\frac{1}{8}$ " x  $\frac{3}{4}$ " mesh, is next step in the grinding process. The clay is then ready to be made into brick, and is carried on a belt conveyor to storage. Tailings from this screen go to an 18 in.

smooth roll crusher and then to the screen shown in (5). The plant had only one 4' x 6' stationary screen and 12 in. single roll crusher before modernization.

(5) A second 4' x 8' Simplicity screen,  $\frac{1}{8}$ " x  $\frac{1}{4}$ " mesh, receives tailings from first screen. Material passing through goes on conveyor belt to storage. Tailings go through a second 18 in. smooth roll crusher and are returned to the first screen. Individual drives in the grinding room have saved enough in replacement of belts and bearings alone during the first year of operation to go a long way toward paying for the installation. Only one man is now required in the grinding room, where four were required before modernization.

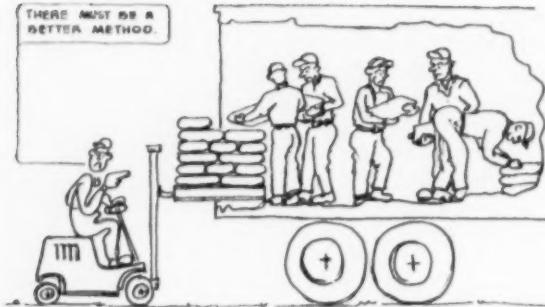
(6) At storage bin, clay is deposited on shuttle conveyor belt (Continental Gin Co.) which runs along the length of the top of the bin.

(7) Belt runs in one direction to fill one end of storage bin, in the opposite direction to fill the other.

(8) Clay is spread uniformly over the bin, insuring even mixing.

(9) Hough 1-yard Payloader dumps ground and mixed clay into screw feeder (J. C. Steele and Sons, Inc.). A conveyor (Continental Gin Co.) takes clay to plant proper, for use in plant's two No. 40 brick machines. Output is 91,000 brick per 40-hour week.





**OLD BAG LOADING SYSTEM**

**Case 15—Tennessee Chemical Plant**

**Unitized Shipping System Reduces Handling Costs 82%**

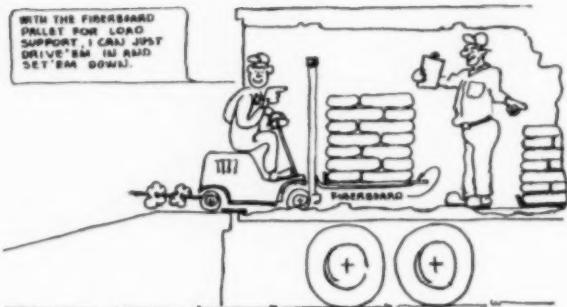
By D. C. Hildebrand  
Tennessee Eastman Company  
Kingsport, Tennessee

THE Tennessee Eastman Company, Division of Eastman Kodak Company, Kingsport, Tennessee, has recently put into effect a unit load system for shipping bagged materials.

A mechanical intra-plant system for handling bags, using wood pallets, has been in use for years, but until just recently all carloading had been done manually.

To place the unitized shipping system in effect utilizing all present handling equipment without purchasing expensive attachments, existing wood pallets were converted to the "take-it-or-leave-it" type by adding four 2" x 2" wood strips for fork entry. This permitted the use of a legless fiberboard sheet for supporting the unit load.

At present our bagging operator is placing the fiberboard on the wood pallet and manually stacking and spot gluing the unit load. In the future a stacking templet and a short section of roller con-



**NEW UNITIZED LOADING SYSTEM**

veyor equipped with a "pincher belt" and "sheep's foot" for automatically flattening and spot gluing will be added. From this point all handling is done by fork truck including tiering in storage, which was made possible by using the wood "take-it-or-leave-it" pallet. On making a shipment, the fork truck operator leaves the wood pallet in the storage area and loads directly into the car using the fiberboard sheet for load support.

This unit load shipping system has decreased handling cost of one product by 82% and has released four men for other more important work. Other advantages are as follows:

1. Reduced demurrage charges due to more rapid loading.
2. Reduced carlining cost as no floor and sidewall lining is necessary.
3. Reduced breakage because of unit load, instead of individual bag, handling.
4. Facilitates inventory control by counting unit loads instead of individual bags.
5. Customer Goodwill and Sales Promotion is a definite advantage, since by mechanical unloading, he can also reduce handling costs.

While the above described system was put in for only one small department in our relatively large plant, wider applications are anticipated as a result of a cartoon (see cut) depicting this idea which was distributed to all production departments.

**Case 16—Alabama Paper Mill**

**Multiple Log Conveyor System**

THE addition of two barking drums at the paper mill of Hollingsworth and Whitney Company in Mobile, Ala., necessitated the installation of an entirely new log conveyor system which presents some rather interesting features of design and construction.

The entire installation was designed and constructed by The Rust Engineering Company in connection with the mill expansion program.

**Conveying System Data**

The yard section of the system, installed without interrupting normal operations and tied in with exist-

ing facilities during a two-week vacation shut-down, had to be re-designed to feed four barking drums instead of two without changing the original two-conveyor arrangement at the unloading source in the woodyard. This meant that two barking drum feeder conveyors must stem from each yard conveyor.

In application, a splitter chute was devised which enables each yard conveyor to transfer its load concurrently to two conveyors, each one feeding a barking drum. A satisfactory division of logs at the transfer point is obtained by adjustment of the splitter chute. This load cleavage has been checked by actual count and found to be well balanced and consistent.

**Special Chain Design**

The conveyor structure is of the usual open frame type common to most log conveyors except that the

### More Information Available

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Case 17—Tennessee Sawmill

### All Purpose Machine for Woods Operations

IN Clarksville, Tenn., Carlton Averett is a typical advocate of mechanical equipment for woods operations of small sawmills. His Hyster tractor-loader, equipped with towing winch is shown in the two above views.

Logging operations are simple and only three men are needed for skidding and loading. The logs are ground skidded into loading position with the tractor and winch, then with the logloading arms, the Traxcavator loads the logs on the trucks for hauling.

wearing base is of high carbon steel, and the chain, hanging from its attachments, travels suspended in a trough below the conveyor bed. The latter arrangement, a change from the usual log conveyor practice, has worked very well, although the real factor contributing most to the system's steady operation at lowered cost probably lies in the special design of the chain itself.

A single strand chain of manganese steel was developed by American Manganese Steel Division of American Brake Shoe Company for use on large log hauls on the West Coast. The Hollingsworth and Whitney installation is believed to be the first time it has been used in a Southern paper mill.

This chain with attachments was selected for high tensile strength and wearing capacity embodied in a specially designed construction. The links are thicker at the articulations, and with their manganese steel sturdiness also have good shock-bearing properties.

A single yard conveyor receiving from trucks and rail cars has successfully handled 50 cords an hour without any sign of overload.

Logs leaving the barking drums are sorted on steel slat conveyors selected because they tend to place the logs in better positions for inspection and removal.

In the new system, particular attention was given to the conveyors feeding the chippers which are 96 in. 10-knife type rated at 60 cords or more per hour. To derive full benefit of this capacity, chipper feed conveyors using the manganese steel chain with a variable speed drive were installed.

This design gives maximum chipper capacity at optimum conveyor speed while enabling the operation to function more efficiently over a wide range of capacity when required.



New conveyors feeding barking drums at Hollingsworth and Whitney's pulp and paper mill in Mobile, Alabama. Note heavy duty manganese steel chain, hanging from its attachments, originally developed for log hauls. Conveyor troughs were given extra strength by using structural steel members rather than plate. This also allows for easier repair since a damaged member can be removed by cutting spot welds at either end.

Conveyors are water lubricated to reduce wear, and no wood is used anywhere in their construction—walkways are of reinforced concrete plank.

## Case 18—Florida

### Wire Mesh Belts In Freezing Tunnels

TO MEET ever increasing demand and offset the high cost of distribution, the familiar can of frozen citrus juice concentrate must be literally turned out by the millions. Many Florida processors have turned to the wire mesh conveyor belt for processing in their freezer tunnels.

Conventional types of conveyor belting cannot withstand constant operation in sub-zero temperatures of the freezing tunnels. Wire mesh belting, on the other hand, is not affected by the extreme temperature changes. Being woven of metal, it possesses the necessary tensile strength to handle heavy loads and the surface characteristics are ideal for the swift and accurate transfer of the cans. Open mesh construction permits free cir-



These cans of frozen orange juice have just passed through a 300 x 8 ft freezing tunnel on a Cambridge GrateX Belt. The cans are transferred to a similar woven wire belt that transports them swiftly and smoothly to storage rooms. Close-up (actual size) of a standard specification of the GrateX belt is at the right.

culation of chilled air and, if necessary, the belt can be defrosted quickly and without harm by merely passing it through a steam bath or a hot water bath on the return side.

The GrateX belt, a product of the Cambridge Wire Cloth Co., is used on many tunnel installations because of its close, smooth mesh, and the fact that it can be produced in any width that is required.

## Case 19—North Carolina Textile Mill

### Mill Modernizes Materials Handling

THE use of an Elwell-Parker electric fork truck, an electric-powered industrial tractor, and a fleet of nine standard trailers have meant fast, efficient handling for a North Carolina textile mill. The company manufactures denim; activities cover operations from raw material to finished product. As an

example of the volume of truck handling, about 70,000 bales of cotton, average weight 500 lb each, and 10,000 bales of cotton waste, average weight 650 lb each, are handled annually with the fork truck.

The fork truck is used to handle heavy machinery and for usual mis-

cellaneous jobs around the plant. It is also assigned the job of handling chemicals (dyes, tallow, oil, zinc dust, soda ash and hydrosulfide), raw cotton and cotton waste material.

In addition, tallow in barrels and dyes in drums, as well as zinc dust in drums, are transported and stacked three high and four high on pallets, four barrels or drums, each weighing over 500 lb, per pallet.

An important example of benefits

The tractor-trailer system is used primarily in this North Carolina mill to transport raw cotton in bales from the warehouse to the mixing rooms. Usually, the tractor pulls five trailers, each with four bales of cotton aboard. The tractor-trailer system serves 15 warehouses.



from mechanization: previously the drums and barrels were stored in the warehouse by hand in one tier (or two tiers of much lighter material). Now, the use of the fork truck has, in effect, tripled the available storage space in the same area.

#### Case 20—Virginia Railroad

### Conveyor Belt Helps Classify Materials

THE first known application by a U. S. railroad of a rubber conveyor belt for classifying track materials for re-use reclamation, or scrap, has been cutting costs at the Roanoke Maintenance of Way Yard at the Norfolk and Western Railway Company.



The conveyor system, equipped with a 24-in. wide, 4 ply belt manufactured by the Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., is 700 ft long. Its advantages include doubling the speed of classifying track materials, easier sorting of material, quicker release of freight car carrying the material into the yard, and greater safety.

The entire materials handling system begins when a crane, equipped with an electro-magnet, lifts the track material from railroad cars onto the belt. The loaded belt passes by a series of 21 bins. At each bin is a workman who tosses into the bin whatever material is to be classified, such as rail joints, tie plates, rail anchors, switch stands, etc. By the time the material has traversed the length of the conveyor, only unsalvageable scrap is left.



#### Case 21—Texas Metalworking

### Scrap Transportation Mechanized

THE City Junk & Supply Co., Houston, Texas, processes scrap metal in every conceivable form—from shop turnings to complete metal forms. Two Gerlinger Material Carriers with specially built bins of 12-ton capacity keep a steady flow of scrap metal from industrial plants in the Houston area coming to City Junk's concentration yard. It is one of the most modern handling systems in the country.

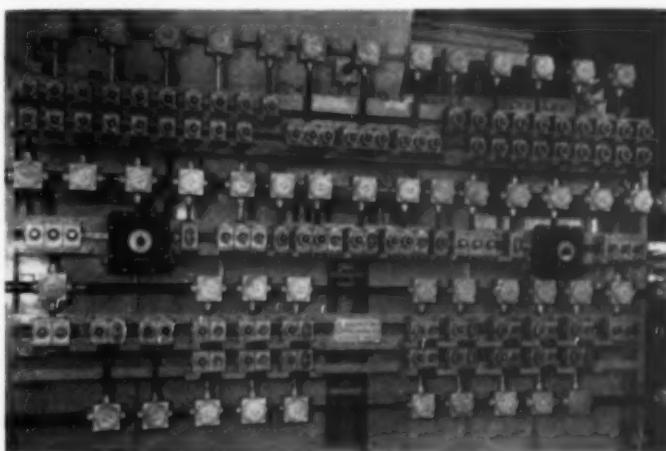
The firm estimates that this complete mechanization of scrap transportation has produced a 40% to 50% saving in per-ton cost over manual loading. Before Gerlingers were utilized, manual loading and unloading resulted in untidy scrap piles and obvious loss through scattering.

#### Case 22—Flour Mill

### Controlling Bulk Material Movement

THIS explosion-proof control panel in a Southern flour mill proportions the ingredients for self-rising flour. Unit controls all bulk material movement in the plant — conveyors, scales, mixers, etc. Materials proportioned are flour, phosphates, salt and soda.

System, engineered by the Richardson Scale Company, consists of eight automatic scales in two lines. Each line of scales supplies two mixers. From these four mixers four conveyors carry the blend to nine packing bins. A fifth conveyor carries flour directly from storage to packing bins, bypassing the scales. The latter system is used when blending is not desired. Vitamins are added by an Omega feeder.



## Case 23—Louisiana Waterworks

### Chemical Unloading by Conveyor

UNTIL about two years ago, oyster shell lime used at the Station "C" water purification plant of the New Orleans Sewerage & Water Board, Algiers, La., was unloaded from tank car entirely by hand methods and trucked in wheelbarrows to a hydraulic lift platform elevator serving the upper floor of the chemical house.

It was laborious, undesirable work, taking four men approximately 40 hours to unload a car holding 45 to 50 tons, at a cost of around \$2.50 per ton. Sometimes there was also a demurrage bill to pay because men were not available and the unloading was not accomplished in the prescribed time.

Today, a Link-Belt conveyor system handles the chemicals automatically and continuously direct from the hopper-bottom outlets of

a tank car into a chemical storage area on the upper floor of building.

Two Link-Belt Bulk-Flo conveyor elevators handle the material to a Link-Belt pivoted inclined, motor-operated distributing screw conveyor, 19 ft long, with outer end suspended by ball-bearing trolleys from a curved 6 in. I-beam above the chemical storage floor. The screw is 12 in. diam., extra-heavy helicoid, operating in the open without a conveyor trough.

As the outside conveyors operate within a steel casing, there is no dusting anywhere from car into building. The "housekeeping" is perfect; the cost of handling has been cut; and demurrage charges have been eliminated.

### More Information Available

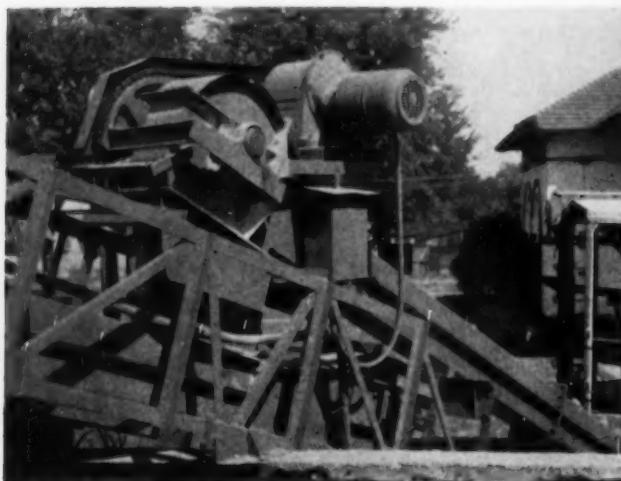
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General view of tank car and Link-Belt inclined Bulk-Flo conveyor system to chemicals storage floor at Station "C" water purification plant of New Orleans Water Board at Algiers, La.

Junction of inclined Bulk-Flo conveyors at retaining wall (below, left) showing Gearmotor and roller chain drive to head shaft of Bulk-Flo No. 1. This first conveyor has a short horizontal run under R.R. track. One end of tank car is shown.

Below, right—Link-Belt 19 ft radius pivoted screw conveyor for stocking out chemicals in the storage building. Left foreground shows 3 hp motor and enclosed worm gear drive to screw. Head of Bulk-Flo conveyor No. 2 extending through building wall, feeds the screw conveyor through a hopper located above its pivot point.



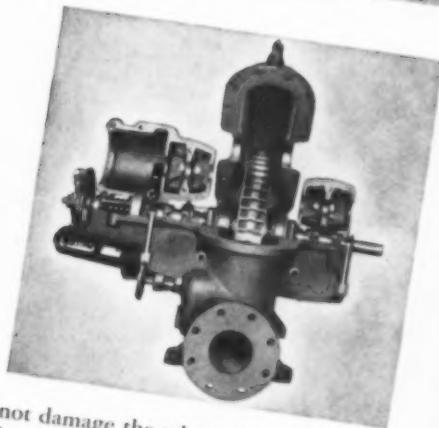
# TERRY

LARGE  
CLEARANCES  
*take the "worry"  
out of  
Turbine Operation*

In a Terry Solid-wheel Turbine the power-producing action of the steam in the wheel takes place on the curved surfaces at the back of the buckets. This unique design permits unusually large blade clearance—see B in the diagram.

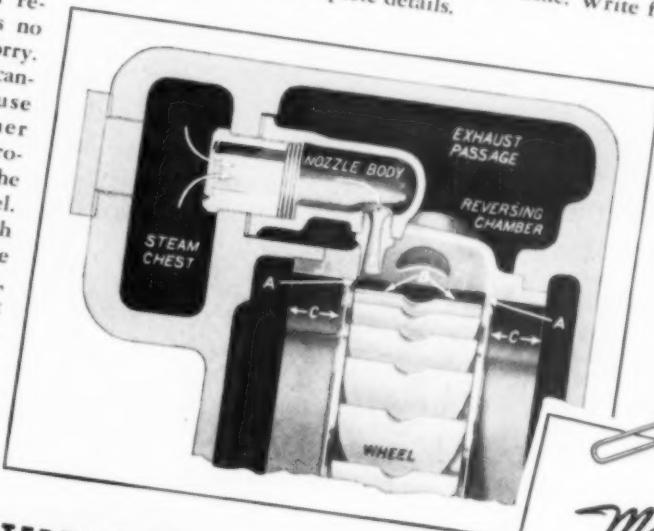
Even if this clearance becomes reduced, there is no real cause for worry. The blades still cannot foul because they are further protected by projecting rims at the sides of the wheel. These rims, which also have ample clearances (AA), will take without damage any rubbing that may occur.

Side clearance, CC, is so large that end-play from external thrust will



not damage the wheel. This clearance is one inch or even greater.

Large side and blade clearances are only two of the many features of the Terry Solid-wheel Turbine. Write for complete details.



THE TERRY STEAM TURBINE CO.  
TERRY SQUARE, HARTFORD 1, CONN.

TT-1191

*Memo*

Send for a copy of bulletin S-116 which describes the many advantages of the Terry Solid-wheel Turbine.

## Case 24—Georgia Quarry

### Crane Repowered

THE conversion of two locomotive cranes from steam to Diesel power has increased stockpiling and yard hauling efficiency and materially reduced operating costs for the Coggins Marble & Granite Industries, Inc., of Elberton, Georgia.

The Diesels selected to replace the steam plants were four-cylinder General Motors two-cycle units with GM torque converters. The installations were made by the Blalock Machinery & Equipment Company, Detroit Diesel Engine Division distributors at Atlanta, Georgia.

The company, which has operated one of the largest granite quarries in the South for 50 years, reports substantial reductions in fuel costs and the saving of one and one-half hours starting and hosteling time per day per crane. These savings are attributed to the greater operating efficiency of the Diesel over steam and the fact that the Diesels, with electric starting,



This American Locomotive crane with a 50 ft boom is stockpiling granite "sawblocks" which the Coggins Marble & Granite Industries, Inc., of Elberton, Georgia, finishes and ships countrywide.

are ready to go at the press of a button.

The stockpiling operation starts deep in the Company's Oglesby pit where granite "sawblocks" are hooked on cables lowered from the cranes' 50-ft booms. The blocks are

brought to the surface, loaded on flat cars and pushed to the finishing plant.

The cranes are used as locomotives in moving the loaded cars and switching empties. Formerly, when  
*(Continued on page 156)*

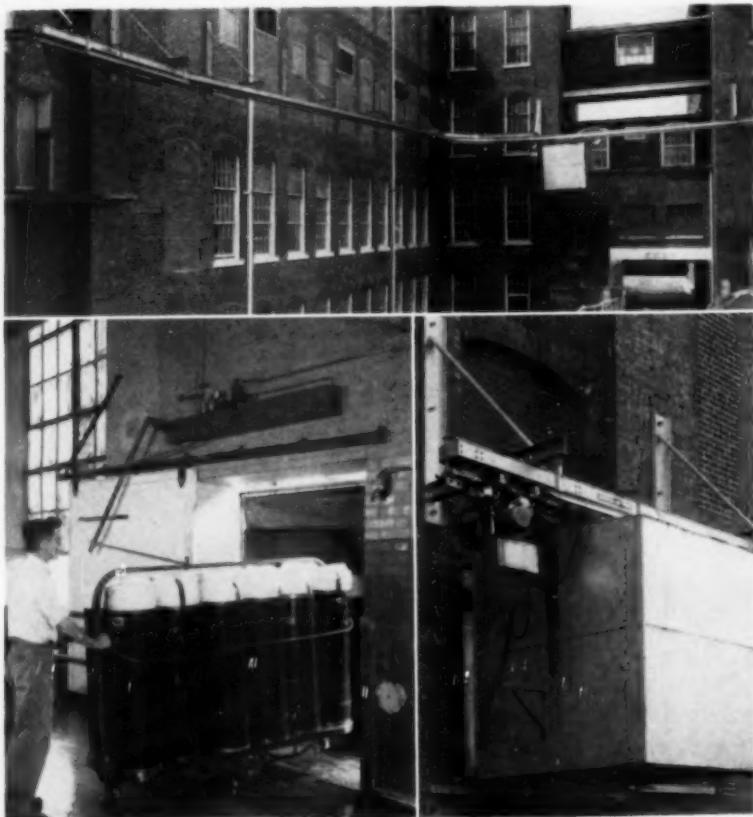
## Case 25—South Carolina Textile Mill

### Automatic Transfer Between Buildings

IN a large South Carolina cotton mill sliver cans are loaded twelve on a special floor truck and two trucks are rolled into a special enclosure on heavy duty MonoRail track which is suspended from brackets mounted against the sides of two buildings. When the operator then closes the door, it strikes a hatch way limit switch, thereby closing the electrical circuit to permit energizing the two American MonoTractor units for propelling the car to the other building.

Upon arrival at the opposite station, a signal light indicates position of car so that the door can be opened for removal of the loaded cans and return dispatch of empties.

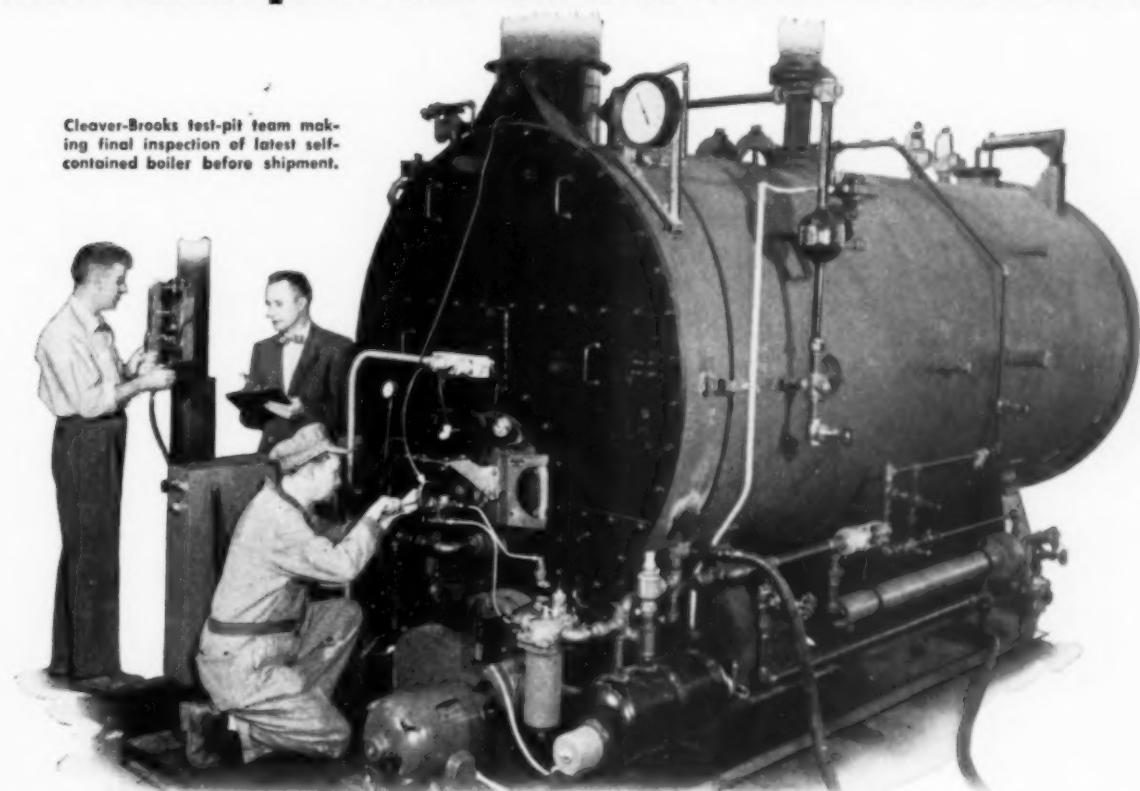
This system eliminates manual hauling between the building and elevation between two floors.





# "Test-Pilots" have at Cleaver-Brooks

Cleaver-Brooks test-pit team making final inspection of latest self-contained boiler before shipment.



## **HIGH SCORES . . . on factory and on-job tests guarantee greatest return from boiler investment**

When test pilots give the familiar "O.K." — that's the sign of proven performance. It's the same with boilers in the Cleaver-Brooks plant. Only after accurate, thorough inspection and testing under actual operating conditions do boilers get the final "O.K." from experienced test engineers. That's why you get guaranteed 80% efficiency from your Cleaver-Brooks boiler.

A record of this test is available to every buyer on request. In fact, you as a buyer, consultant, or contractor are invited to witness the actual test on your Cleaver-Brooks boiler before shipment.

And further, Cleaver-Brooks boilers are placed in operation at the job site by factory service engineers who check installation, train your operators and make complete and detailed field tests.

So, when you buy a boiler, insist on factory tests as well as field service tests by qualified engineers. There is no better way of insuring yourself of the very best value money can buy and the greatest return from your boiler

Available for oil,  
gas and combi-  
nation oil/gas  
firing.



investment. Look to Cleaver-Brooks, the leader in the "Packaged" Boiler field for two decades. Write today for latest Catalog AD-100.

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**Cleaver-Brooks**

Originators of the  
Self-Contained Boiler

**BOILERS — STEAM OR HOT WATER — FOR HEATING AND PROCESSING IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI**

SOUTHERN POWER & INDUSTRY for OCTOBER, 1953

# Power Transmission

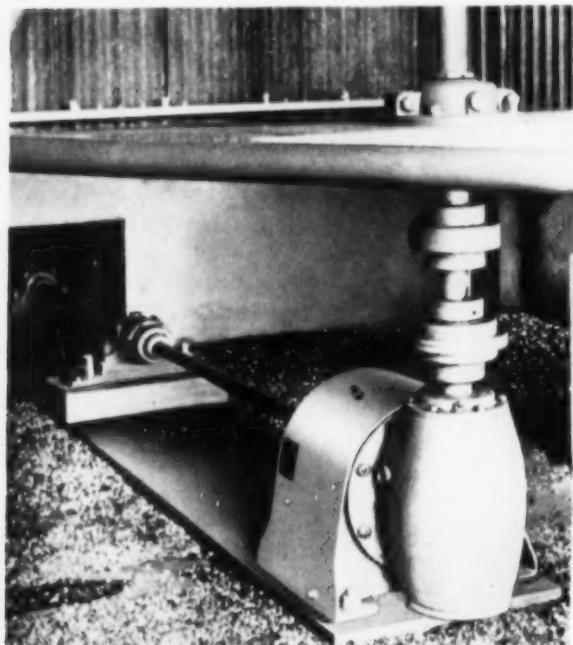
## Section 4

*Thirty-five foot horizontal drive shaft turns 1800 rpm and transmits maximum of 25 hp . . . motor drive conversion . . . packaged type drive . . . belts . . . heavy-duty chain drive*

### Case 26—Texas Pipe Line

#### Flexible Couplings Prove Worth on Cooling Tower Fan Drive

DURING the spring of 1950, the Trunkline Gas Company of Houston, Texas, designed their gas transmission line from the Gulf Coast to Illinois. It



was decided to drive the water cooling fans directly from the 2,000 hp gas compressor, necessitating the use of a thirty-five foot horizontal drive shaft turning 1800 rpm and transmitting a maximum of 25 hp.

#### Equipment Selected

To drive the cooling tower fan, Trunkline Gas used the following equipment:

From the compressor drive to the speed reducer, the shafting system was laid out with six foot shaft sections supported by pillow blocks, alternating with five foot floating shaft sections, each floating section to be supported at each end by a Falk Piloted Steelflex coupling.

The use of floating shafts offered several distinct advantages over other layouts.

- 1) Only half the usual number of bearings was needed.
- 2) In a shaft of this length and speed, parallel or angular misalignment might be expected—with consequent problems, such as uneven bearing loading. Because the Steelflex couplings would accommodate certain degrees of parallel or angular misalignment, mechanical difficulties due to misalignment would be minimized.
- 3) The torsional resilience of the Steelflex couplings would protect the speed reducer by cushioning

Trunkline Gas Company of Houston, Texas, drive their water cooling fans directly from the 2,000 hp gas compressor, necessitating use of a 35 ft horizontal drive shaft turning 1800 rpm and transmitting a maximum of 25 hp. Falk Corporation couplings and speed reducer are employed.



● Yarway Seatless Blow-Off Valve showing balanced sliding plunger in closed position. For pressures to 400 psi. Available singly or in tandem, angle or straightway.

## BEHIND IT...AN ENGINEERING REASON

More than 16,000 boiler plants use Yarway Blow-Off Valves. Why?

Because behind each valve is an engineering reason.

Take the Yarway Seatless Blow-Off Valve for low and medium pressure boilers. *It has no seat to score, wear, clog or leak.* The unique balanced sliding plunger eliminates a common source of blow-down valve trouble. Many boiler shut-downs are saved...power interruptions avoided

and...production speeded.

Specify Yarway Blow-Off Valves on your boilers—*including package units.* You'll be rewarded by dependable, trouble-free blow-down service.

Write for Yarway Blow-Off Valve Bulletin B-425 (pressures to 400 psi) or Bulletin B-433 (pressures to 2500 psi).

**YARNALL-WARING COMPANY**  
Home Office: 116 Mermaid Ave., Phila. 18, Pa.  
Southern Representative:  
ROGER A. MARTIN, Bona Allen Building  
Atlanta 3, Ga.

**YARWAY** / *blow-off valves*

the irregular torque characteristics of the engine drive.

A Falk right angle speed reducer was selected to drive the vertical fan shaft. Because of the high mechanical efficiency of the single helical and spiral bevel gears used in this reducer, 96 to 97% of the power taken from the compressor drive would be utilized for driving the fan shaft.

A Type F Steelflex Coupling was used to connect

the vertical shaft of the speed reducer to the shaft of the fourteen-foot axial-flow cooling tower fan. The design of this coupling would permit the accommodation of a certain amount of shaft misalignment which might develop between the shafts—and would also smooth out the irregular loads which might otherwise be imposed on the speed reducer.

The installation has worked out as planned—to the complete satisfaction of the owner.

#### Case 27—Alabama

#### Motor Drive Conversion

THE Brundidge Milling Company, Brundidge, Alabama, manufactures horse, cow, pig and chicken feeds of all types. About a year ago the company removed the old line of feeders used to measure the quantity of different ingredients that go into a batch of mixed feeds. Plant engineers installed a line of Gump continuous feeders, all driven by individual Sterling Speed-trol Motors. The new installation allows the operator to control the amount of each ingredient going into the batch with extreme accuracy.

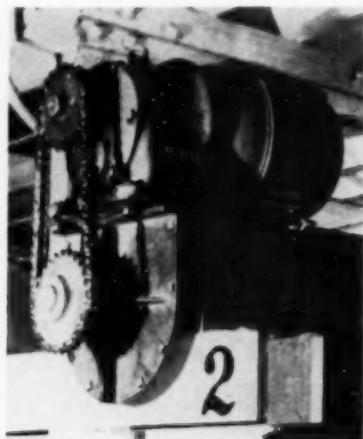
Since this new installation, the company has doubled its production with no increase in plant size. It has also been able to meet more exacting standards, crediting the improved quality to the ability of the Sterling Speed-trol to hold any set speed, and the operator to

regulate the Speed-trol to minute changes of speed.

The old rocker type units were continually breaking down, causing considerable trouble and decreased production. There has been no lost time due to breakdowns since the installation of the new units.



The modern FWB Sterling Speed-trol motors shown below replaced these old rocker type feeders, which were driven by line shafts.

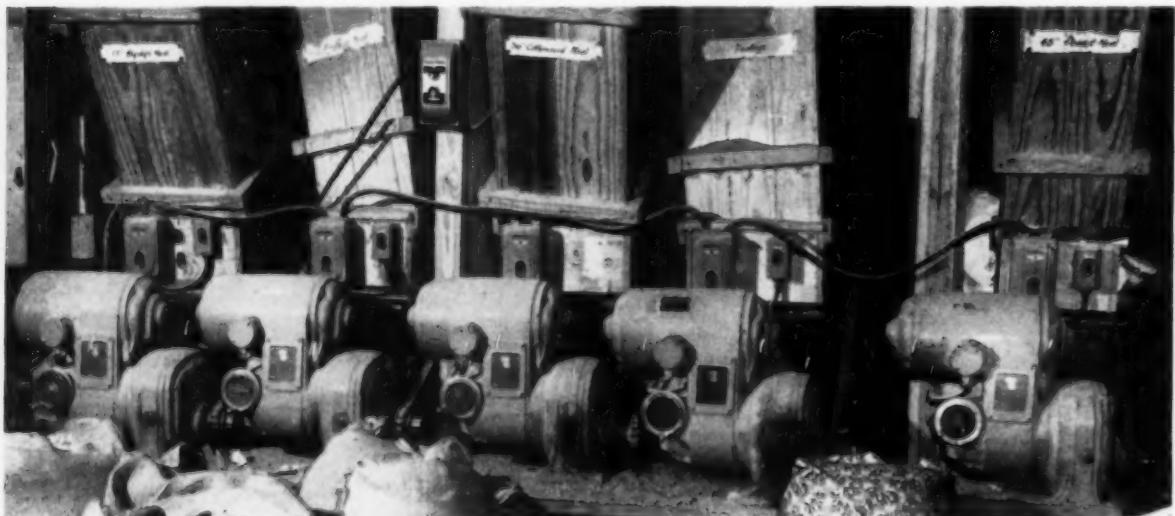


#### Case 28—Texas

#### Packaged Drive

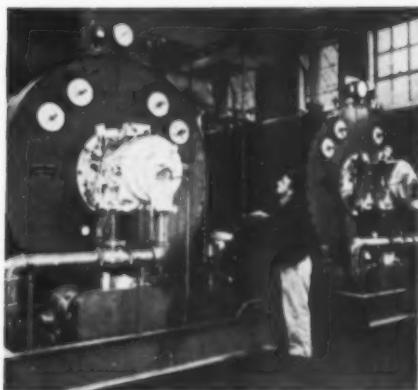
ALL machines in a large Southern rice mill are gradually being changed to individual motor drives. Most of them are the modern "packaged" type.

Here is a 12 in. screw (Helicoid) conveyor above the rough rice storage which is used to fill them. This is driven by a garmotor (Link-



# 9

## REASONS WHY STEAM COSTS GO DOWN



**Completely Automatic Operation**—Full complement of finest up-to-date operating and safety controls provides maximum operating dependability and protection with least possible attention from operator.

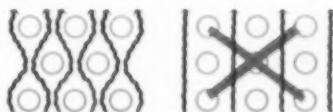
.....where *Powermasters* go in ...



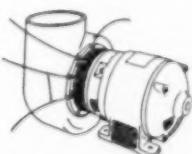
**3-Pass Boiler** with successive parallel paths and single gas flow reversal at each end assures most efficient flue gas velocity and heat transfer, provides maximum maintenance convenience, and requires no complex front end baffling.



**Infinitely Variable Combustion Modulation** automatically maintains proper fuel-air ratio for most efficient firing at all loads. Instant response to load swings between 20% to 100% of firing rate saves fuel and assures constant steam pressure and temperature.



**Staggered Tubes**—Freedom from ineffectual boiler water eddies assures quicker heating, faster steaming, and high quality dry steam. Scrubbing action of rising water prevents corrosive gas deposits on tube surfaces.



**Forced Draft** provides most accurate control of combustion air supply; permits use of smaller, low-cost stack, fan and motor; requires less fan maintenance because no hot products of combustion pass through the fan.



**83% Guaranteed Minimum Efficiency** with No. 6 oil. At less than full load, *Powermaster* efficiency actually increases! ASME field tests prove *Powermaster*'s superior performance.



**Easy Accessibility** for tube cleaning and inspection is provided by swinging rear cover, and divided front cover that is readily removable without disturbing burner or accessories. Convenient handholes facilitate waterside inspection.



**Veriflow Burners** keep fuel costs low and boiler efficiency high at all loads. Air-atomizing oil burner (left) and pre-mix gas burner (right)—designed by O&S expressly for *Powermaster*—provide complete, clean combustion over full firing range. Simple, sturdy construction with no moving parts, absence of vibration, and ease of cleaning minimize maintenance. Combination burner allows quick change from one fuel to another.



Send for this NEW BULLETIN

Describes and illustrates all cost-saving features of the modern, completely assembled, and factory fire-tested *Powermaster*. Ask for Bulletin 1219 on your company letterhead, stating your steam requirements and operating conditions.

**Powermaster®**  
**PACKAGED AUTOMATIC BOILERS**  
In sizes to 500 HP; pressures to 250 psi.



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New profits in terms of tons of valuable dust that can and should be returned to production rather than being wasted in the air.

Getting at those profits is our business! In one plant, for instance, Buell Engineers recovered over 200 tons of valuable dust in a single week. A clear example of the superior efficiency of Buell equipment. Just send in a sample of the dust, Buell Research can tell you how best to reclaim its value.

With these facts in hand, Buell has served dozens of America's Leading Companies. Why not send for the names of several in your own field?

Our informative brochure—The Collection and Recovery of Industrial Dusts—explains all three Buell systems of industrial dust recovery. For your complimentary copy, write Dept. 80-J, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.



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*20 Years of Engineered Efficiency in*  
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**HERE'S THE ANSWER  
TO YOUR SMALL FLOW  
CONTROL PROBLEMS**

## a NEW REDUCING VALVE



**SEND FOR DESCRIPTIVE BULLETIN 511-A  
WITH COMPLETE CAPACITY TABLES**

**Before you order—**

The new Class LCB is just one of the many units that are *special* with most manufacturers but are *standard* with Leslie.

Check to see if any pressure, temperature or level control you want is standard with Leslie, before you order. Play it safe. Your Leslie Engineer is listed under "Valves" or "Regulators" in the classified telephone directory in principal cities.

for accurate, foolproof regulation of small flows of steam, air, gas or liquids, with inlet pressures to 1000 psi and reduced pressures from 2 to 400 psi.

Change operating conditions quickly and easily with simple, handwheel adjustment —no need to waste time changing springs or swapping parts. Check these widely accepted Leslie features that are standard in the new, efficient, Leslie Small Flow Reducing Valve.

*Check these Features*

- Simple, compact construction
- Top quality materials
- Metal Diaphragm
- Entirely enclosed—no stuffing boxes
- Corrosion resistant springs
- Hardened stainless steel valve
- Interchangeable inner valves

**LESLIE**

**THE FIRST NAME IN PRESSURE,  
TEMPERATURE AND LEVEL CONTROLS**  
*Since 1900*

**LESLIE CO., 261 Grant Avenue, Lyndhurst, New Jersey**

Belt) and roller chain transmission to the conveyor shaft. The installation was made when this new addition to the existing mill was constructed and represents the most up-to-date practice.

Note that the drive is mounted

on top of the conveyor where it is out of the way and occupies no space which could be used for anything else. This of course is possible because of the compactness of the gearmotor and the roller chain transmission.

#### Case 29—Mississippi

#### Transmission Belt

THE transmission belt illustrated drives all the machinery in a large wood flooring mill in Mississippi. A leather belt previously was used on this drive but it stretched so badly that it had to be

The strongest belt fabric made is used in Highflex. Fabric is not folded at sides of belt. It has a squared edge. The belt is more flexible and rides easily over pulleys. Prestretched to reduce internal strain when belt is in use, the belt stays tight on pulleys, runs straighter. Plies are seamless with fabric used full width and full length to eliminate weak spots.

re-glued every 30 days. Then a B. F. Goodrich Highflex transmission belt was tried. In use five years when this picture was taken,



the B. F. Goodrich Highflex belt had not once needed attention.

#### Case 30—Louisiana Pumping Plant

#### Heavy-Duty Chain Drive

AN efficient, heavy duty, Morse Hy-Vo chain drive is one of the main features of new pumping equipment installed by Sweetlake Land & Oil Company to increase the capacity of their Lake Charles, Louisiana, rice field irrigation pumping plant.

The new equipment, which has more than doubled the station's pumping capacity, includes a 384 hp, 300 to 500 rpm variable speed, Worthington natural gas engine and a 45 in. discharge Worthington pump that raises 60,000 gpm, 16 ft.

Continuous operation of the pumping equipment has been assured by providing a long-life, maintenance-free, 2 in. pitch, standard Hy-Vo drive made by Morse Chain Company. This drive has 25 and 96-tooth sprockets that reduce the pump speed to the desired rpm.

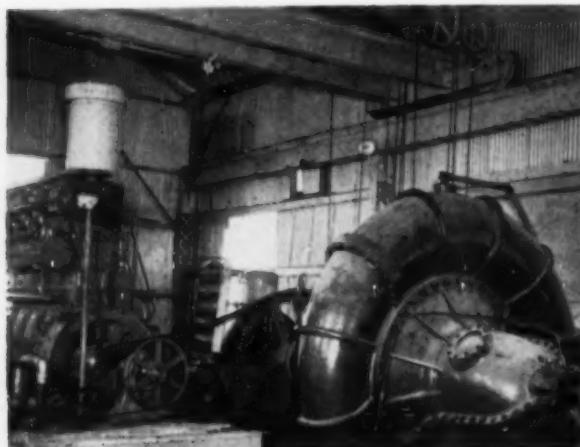
Long wear life and high efficiency of the Hy-Vo

drive, results from smooth, shock-free engagement between the chain and sprocket teeth. Unique low-friction rolling joints in the chain and involute-formed tooth profiles on the sprockets provide the engagement principle that permits up to 20,000 hr wear life for the drive.

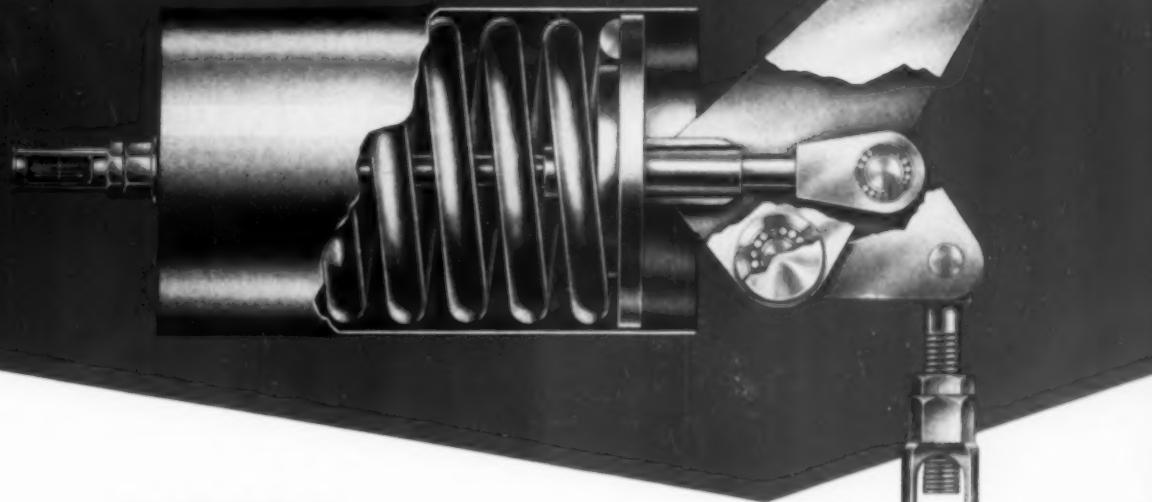
The standard Hy-Vo chain, which is extremely narrow for its load carrying capacity, has an average ultimate tensile strength of 240,000 lb. This high strength results from a new balanced chain link design and high alloy steel link and pin materials. The entire Hy-Vo drive is enclosed in a steel chain case that is provided with a pressure lubrication system.

The former pumping equipment, which remains in operation in the pumping station, includes a 36 in. discharge Worthington pump direct driven by a 170 hp diesel engine.

An overall view of the new pumping equipment. From left to right are the natural gas engine, Morse Hy-Vo drive and pump. At the right, Sweetlake Land and Oil Company engineer D. Robideaux inspects the recently installed Morse drive. Cover of the chain case has been removed to show the chain and sprockets.



# You Get Time-Tested Dependability With



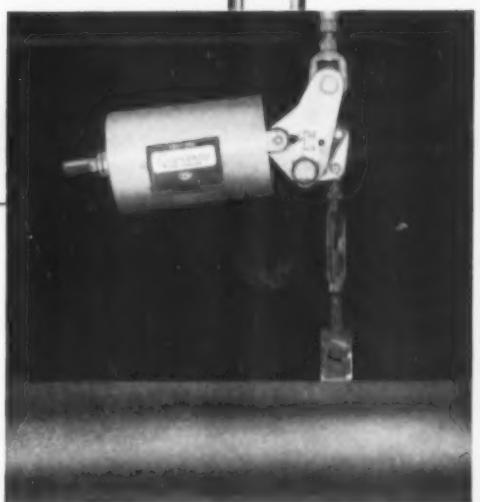
# NAVCO *Counterpoise*<sup>\*</sup> Pipe Hangers

The constant load-carrying capacity of Navco Counterpoise<sup>\*</sup> Pipe Hangers has been proven during an extended period of satisfactory service as the first accurate and efficient support for high temperature piping systems. They are being used extensively in steam generating stations, refineries and chemical plants.

The Counterpoise Hanger is a spring-actuated counterbalance. An ingenious system of linkage transforms the varying force of the spring in an accurate mathematical ratio to produce a load supporting effort of constant value throughout the entire range of expansion travel.

The design permits great flexibility of installation and saves valuable space in congested areas. All parts are ruggedly made and have a high safety factor, yet excess weight and oversize physical dimensions have been avoided to hold space and structural load requirements to a minimum.

The Navco Counterpoise Hanger is available in 16 different frame sizes with load capacities ranging from 200 to 16,000 pounds and expansion travels up to 12 inches. For detailed information on how you can get dependable support with this unique hanger, write today for our 12-page illustrated bulletin #153.



Note above how the flexible top connection permits the hanger assembly to fall in line with the direction of the load pull, so that horizontal travel of the piping has no appreciable effect on the hanger operation. The unit may be positioned at any angle. This affords flexibility in installations where close clearances are a factor.

<sup>\*</sup> Counterpoise is a trade name of the National Valve & Manufacturing Company



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# Power and Steam Supply

## Section 5

Packaged boilers . . . scale, corrosion and alkalinity reduced . . . underfeed stokers . . . fly ash problem . . . sludge trouble . . . demineralization . . . gas burners with standby coal . . . diesel intercooler . . . more efficiency from wood waste fuel

### Case 31—Georgia

#### Steam Generators Modernized With Flame Failure Protective Devices

THE modern boiler room at the Dalton, Georgia, plant of Cabin Crafts, Inc., world famous manufacturers of tufted bedspreads and floor coverings, is equipped with three Amesteam oil fired packaged boilers, manufactured by Ames Iron Works, Inc. Each unit has identical burner installation, but

was equipped with different types of flame failure safeguard. As newer and more reliable flame failure protective devices were developed, the boiler manufacturer had kept pace and improved the operation of their units by using the more dependable control.

The first of these boilers, a 200

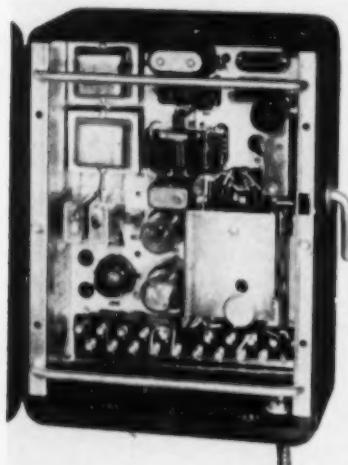
hp unit, was installed in 1946. It was equipped with a conventional type of flame failure control, consisting of a flame rod to monitor the gas pilot and a photoelectric cell to scan the oil flame. While this equipment represented modern engineering at time of installation, it proved to be troublesome and undependable, causing many nuisance shut-downs which could not be tolerated in a plant of this type.

In 1948 the second unit of 300 hp capacity was installed. In an effort to overcome the difficulties experienced due to nuisance shut-downs on unit #1, it was decided to install a control system which omitted the flame rod (believed to be major cause of trouble) and use instead a system that employed radiant heat from the light of the flame to actuate a bimetal type contact. While this system did not improve the pilot, it did give a more trouble free installation.

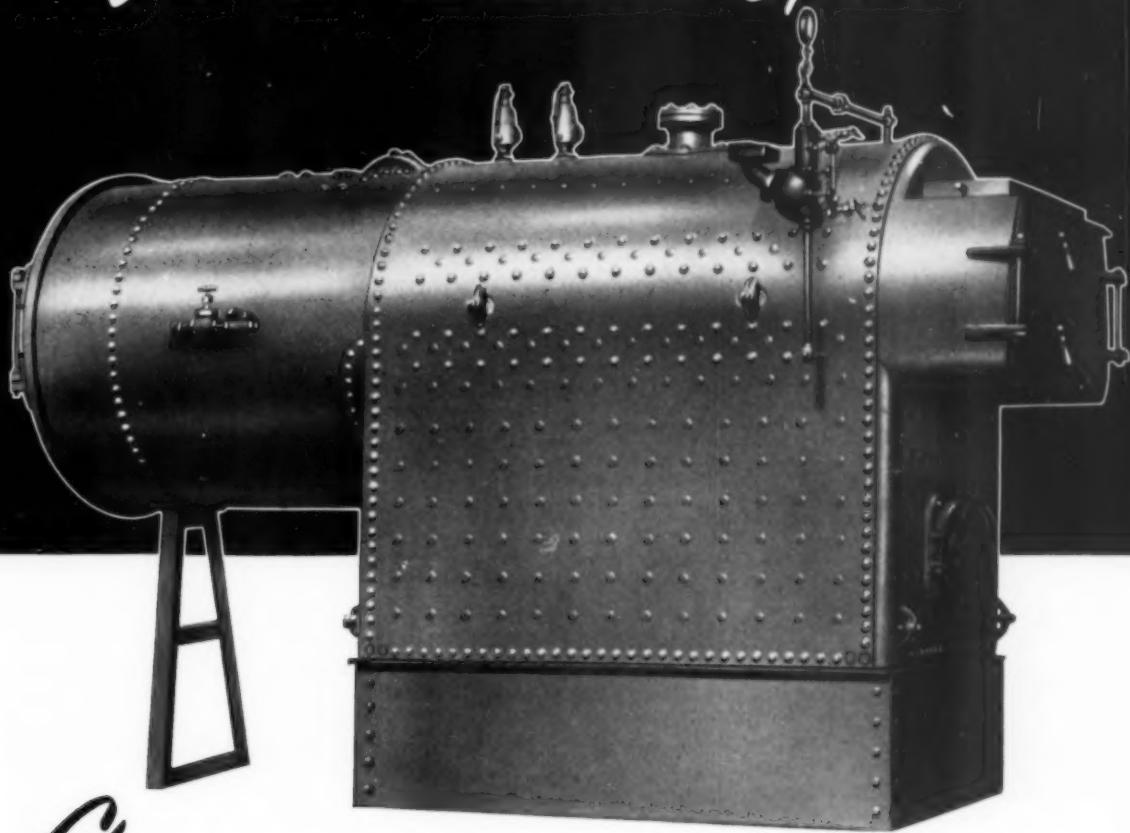
The third boiler, a 300 hp unit, installed in 1951, was equipped with a modern type photoelectric scanner to monitor the gas pilot and the main oil flame and gave complete protection. However, unusually low pressure gas from the local gas distribution system, made it necessary to install a booster on the

By Dale T. Allen  
Allen & Vickers Engineering Co., Inc.  
Atlanta, Georgia

Combustion Control Corporation's Fireye flame failure protection and programming for automatic burners. Chassis of the control, containing all working parts, is of the plug-in type and can be installed quickly by adjusting just two screws and no wiring. With the chassis so easily installed, proof of trouble in the chassis or elsewhere is readily determined and corrective action can be taken without lengthy trouble shooting with a boiler out of service at an inconvenient time.



# POWER with POWER to Spare



## Announcing

### A NEW DOUBLE PASS ALL-PURPOSE INDUSTRIAL AND HEATING BOILER SOUTHERN MADE FOR SOUTHERN TRADE

Made in sizes from 44 H.P. to 153 H.P. S.B.I. rating with pressure to 150 lbs. Designed for coal, gas or oil firing, the New Lucey Double Pass Boiler can be furnished complete as a package unit.

This boiler is in addition to our regular line of single pass fire box boilers which we have been making since 1918.

WRITE FOR BULLETIN NO. 153 FOR COMPLETE SPECIFICATIONS

# LUCEY

BOILER and MANUFACTURING CORPORATION

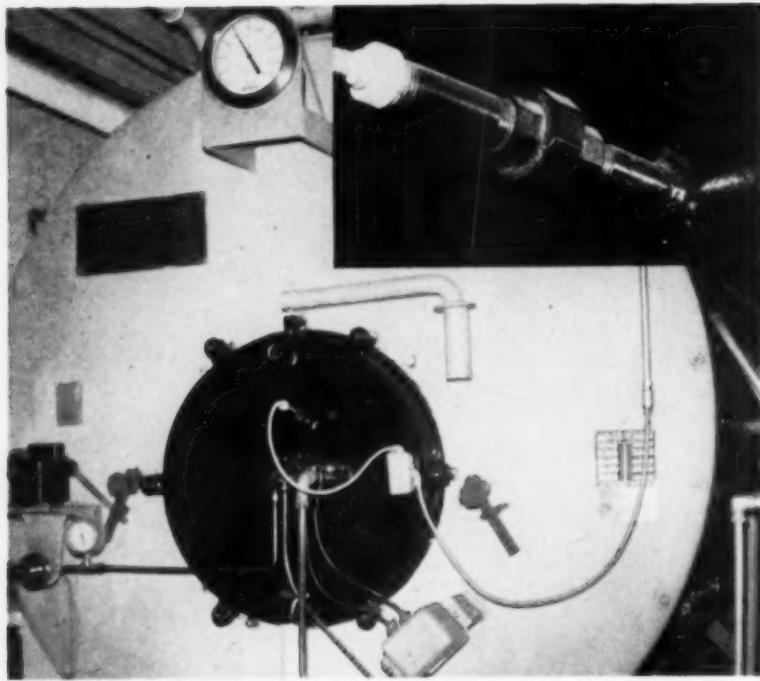
CHATTANOOGA,

TENNESSEE

1514 CHESTNUT ST.  
CHATTANOOGA



1312 STERLING BLDG.  
HOUSTON, TEXAS



One of the 300 hp Ames heavy oil fired boilers at Cabin Crafts, Inc. Inset shows simple installation of Firetron cell scanner on  $\frac{1}{2}$ " pipe nipple.

gas line to provide a pilot flame of sufficient luminosity to obtain satisfactory operation of the photo cell.

#### New Control System

In the fall of 1952, plant management decided to equip all three boilers with the best flame failure protective devices available and va-

rious types were considered. The photoelectric scanner equipment furnished by the boiler manufacturer on the 1951 boiler had been the most satisfactory to date, but it was felt that use of additional boosters on the already overburdened gas line might create a gas shortage in the neighborhood. It was realized that a device was need-

ed which could monitor a gas flame without being dependent on its luminosity and also to be capable of monitoring an oil flame with its great luminosity.

This desirable device was found in the newly developed Fireye FP-2 system, manufactured by the Combustion Control Corp., Boston, Mass. (the photoelectric control used on unit #3 was of the same make), which Ames Iron Works had begun using by early 1952. This new control system uses the Firetron cell to monitor the infra red modulations of the flame, reacting to the presence of flame regardless of color and having the added advantage of being able to discriminate between infra red from flame and infra red from hot refractory. After careful consideration flame failure equipment of the Firetron cell type was purchased and installed on all three boilers. The need for additional boosters was eliminated and more satisfactory operation of the boilers resulted with even greater safety. In addition, interchangeability of controls on all three boilers is an advantage.

By installation of these new Firetron systems Cabin Crafts, Inc., modernized the boiler controls with excellent results from several standpoints—interchangeability of controls on all boilers, reliability of operation, less maintenance and greater safety.

#### Case 32—N. C. Paper Mill

#### Boiler Feed Pump

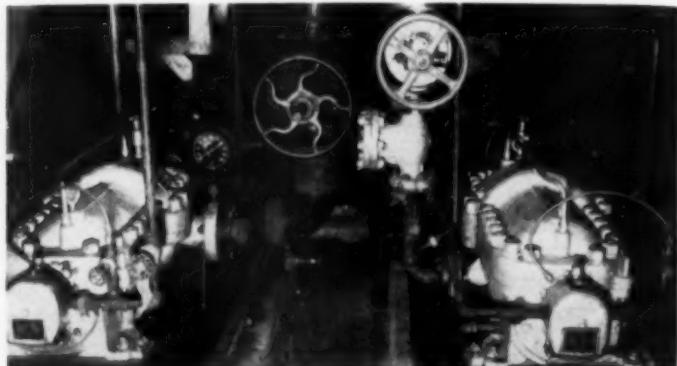
TWO 8-stage Ingersoll-Rand boiler feed pumps of a new, modern design serve the 60,000 lb boiler that supplies steam to the 2500 fpm paper machine turbine driver at a North Carolina paper mill. These pumps discharge at 605 psi, delivering 180 gpm of 230 F water to the boiler.

The pumping units are of the opposed impeller group type, this construction being used to neutralize axial thrust forces within the pump. Fully separate diffusers are used to convert velocity energy into pressure energy without radial thrust—at all conditions from zero

to full load. The multiple volute passages are contained in separate channel rings for each stage. These channel rings form a rotor assembly that can be removed from the smooth bore casing as a single, compact unit. This unit-

type rotor construction makes these pumps easier to work on and more simple to assemble and dismantle than any other pump of this type.

Interstage leakage is prevented by step seal piston rings which fit around each channel ring and are





# Consider the Atomic Power Plant...

**when critical piping  
is the order!**

TODAY'S OPERATING TEMPERATURES and pressures so closely approach the maxima for available piping materials that nothing can be left to chance... to empirical design. And detailed mathematical calculations to determine all the stresses in a modern, complicated piping system is a herculean task.

However, Kellogg's model tester, employing patented electrical measuring heads (illustrated) fulfills the need for rapid, exact testing for all forces and moments in a proposed system. An added advantage in this method is that changes in design indicated during testing can be immediately incorporated in the model—and testing continues reflecting the effect of the changes in design on all other phases.

While Kellogg's model tester has been used primarily on central station systems (piping arrangements for a total of some 4,700,000 KW's have been investigated to date), it is no wonder that the equipment was again

called upon when the power plants for the first atomic submarines were being designed.

All the facets of these extremely critical piping systems—considerably complicated by the confined space within submarines—were thoroughly checked and rechecked on the model tester to assure the operational soundness of the design.

This approach to the problems of high-pressure, high temperature piping—the desire to be sure, to explore new testing techniques, and to constantly improve welding procedures—is Kellogg's basic stock in trade. Many power station designers and utility companies also say it's the basic reason why they repeatedly specify "critical piping by Kellogg."

#### NEW K-WELD PROCESS . . .

Send for descriptive literature about the new K.Weld process which assures complete penetration without the use of backing rings.

These leading companies  
are among the many major  
producers of power who use  
**M. W. KELLOGG POWER PIPING . . .**

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# GAI-TRONICS POWER PLANT COMMUNICATION SYSTEMS...

*Prove that ENGINEERING  
and EXPERIENCE make  
the BIG difference!*

The completely engineered GAI-Tronics power plant communications system is designed and built by men associated with the design, construction, and operation of power plants throughout the world. Their "know-how" insures the solution to your power plant communication problems.

Two-way or group conversations can be carried on over telephone-type handsets and sound projectors without using special booths. The projectors can be used for paging and issuing emergency instructions. If you desire, telephone-like privacy may be had with the flick of a switch even though the system remains alerted for emergency use. The completely engineered GAI-Tronics system can be installed by your maintenance men. With a GAI-Tronics system, your power plant is equipped with a custom-designed, internal communication system that is easy to install; easy to operate; easy to maintain. A GAI-Tronics power plant communication specialist will be glad to discuss your communication problems.



**CONSULTING**



**DESIGN  
AND ENGINEERING**



**FABRICATION**



**OPERATION**

**FREE!**

A booklet—Power Plant Communication Systems—or a convincing demonstration in your plant. The portable GAI-Tronics system designed by our engineers for this specific purpose can be scheduled for your plant upon request without obligation. Write today, Dept. G-S.

**GAI-TRONICS  
CORPORATION  
READING, PA.**



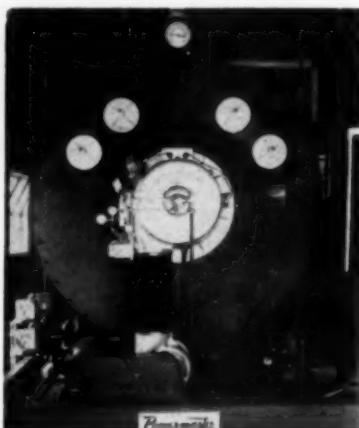
A SUBSIDIARY OF  
GILBERT ASSOCIATES, INC.

automatically compressed to the proper degree when the casing is bolted together. These rings eliminate the matching ring fits that required extensive maintenance time in older style pumps.

**Case 33—Virginia**

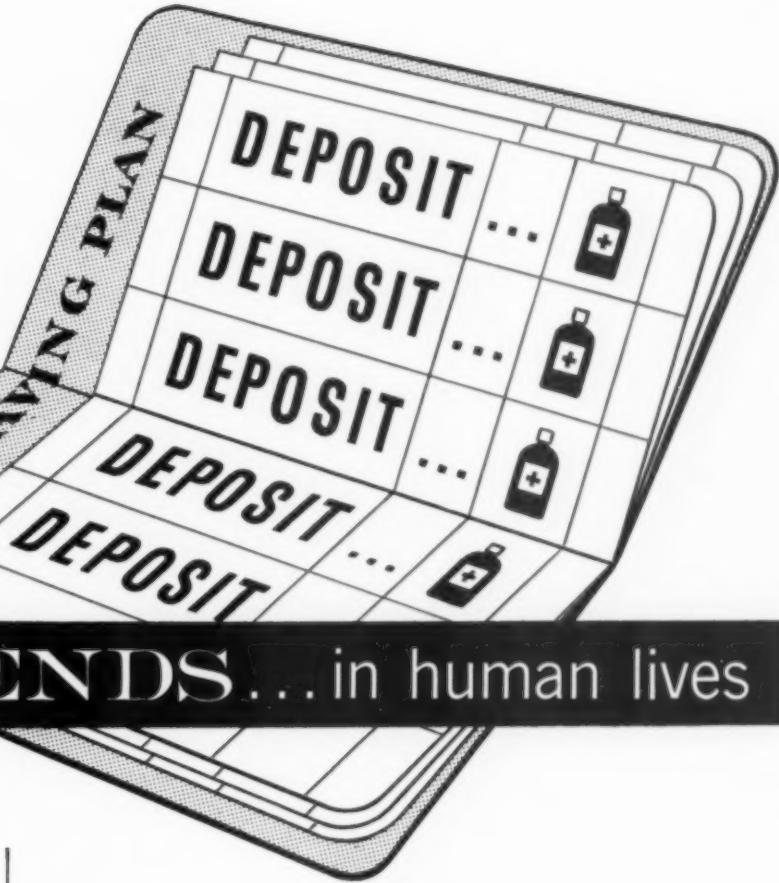
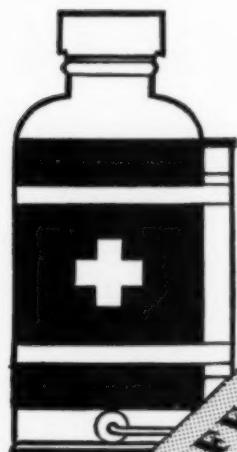
**Packaged Boiler**

THIS 400 hp Orr & Sembower Powermaster packaged automatic boiler, installed in the McNeal-Edwards Company plant at Reedville, Virginia, is used to supply steam at slightly over 100 lb pressure for the processing of menhaden fish solubles, the final products being fish oil and residual solid wastes used for fertilizers. While the maximum steam load approaches 14,000 lb/hr, there are frequent periods of light load of sufficient duration to make the efficiency at less than full load highly important.



Uniform efficiency at all points between full load and 30% of full load is secured by having the fuel and air ratio to the (Voriflow) air atomizing oil burner correctly proportioned. The mechanism is an adjustable cam which positions the fuel valve and an adjustable linkage which positions the damper. These adjustments are set and locked during factory tests after checking against flue gas analysis and stack temperatures at each of a large number of check points.

Thereafter during actual operation wherever the damper motor positions itself, controlled by boiler pressure reflecting steam demand, the fuel-air ratio at that specific



## DIVIDENDS...in human lives

### BUSINESS EXECUTIVES! CHECK THESE QUESTIONS

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
- HAVE YOU CONDUCTED A DONOR PLEDGE CAMPAIGN IN YOUR COMPANY?
- HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

Remember, as long as a single pint of blood may mean the difference between life and death for any American . . . the need for blood is **urgent**!

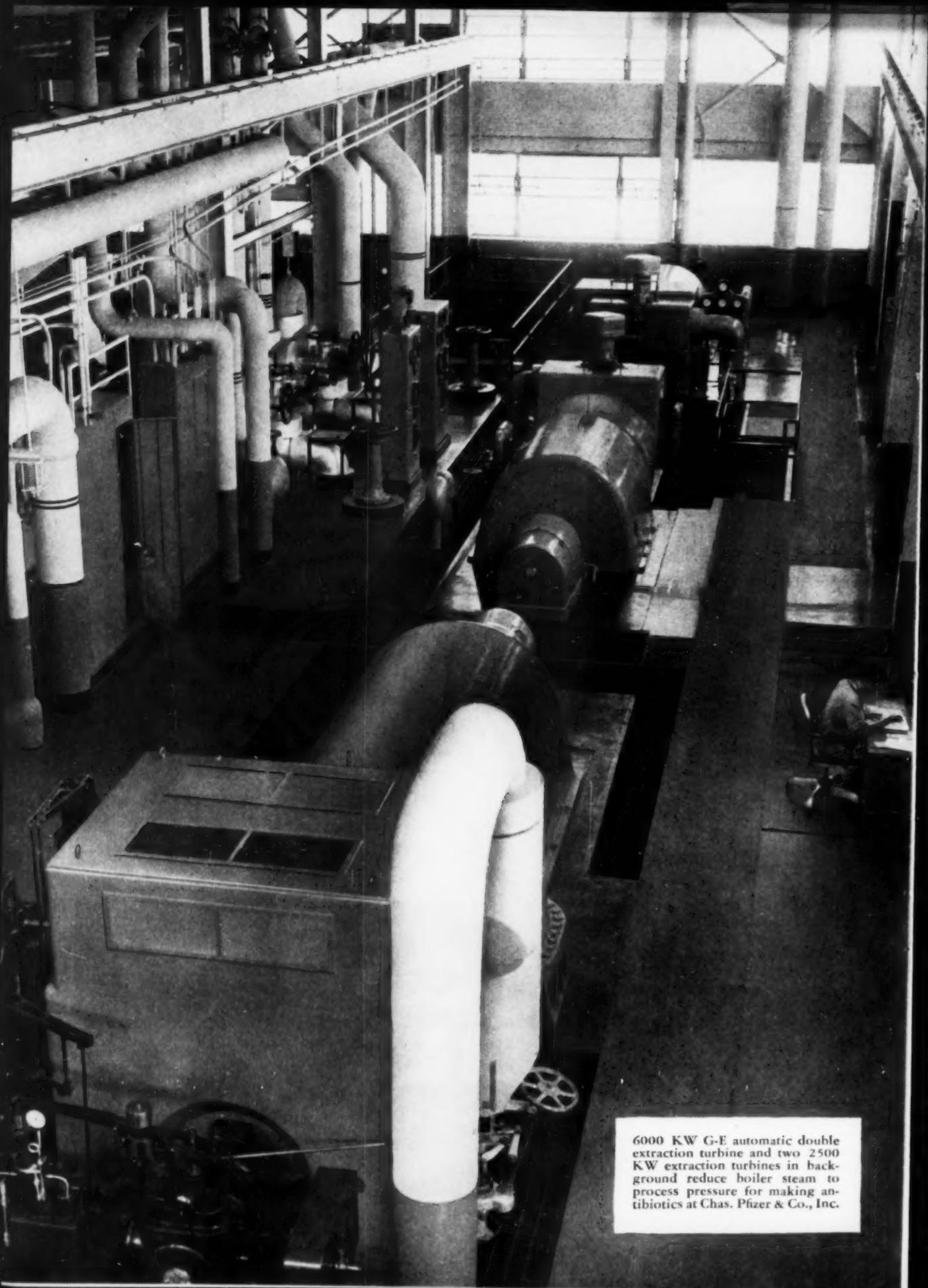
America's blood bank needs **more** blood, **now**. Be a regular depositor and know that your dividend is saving a life of some American—somewhere.

It may be a soldier shot down in battle, suffering from **shock**. Or someone here at home, sick and in dire need of new blood to restore life. A mother in childbirth, or a child in an accident.

America must give. America is **you**. Won't you call your Red Cross, Armed Forces or Community Blood Donor Center right now, for an appointment?



NATIONAL BLOOD PROGRAM



6000 KW G-E automatic double extraction turbine and two 2500 KW extraction turbines in background reduce boiler steam to process pressure for making antibiotics at Chas. Pfizer & Co., Inc.

# G-E Extraction Turbine at Chas. Pfizer & Co., Inc. Increases Plant Thermal Efficiency Over 15%

Extraction pressures held constant, even under varying loads; turbines reduce boiler steam to process pressures for use in making antibiotics

Plant thermal efficiency was increased over 15% when Chas. Pfizer & Co., Inc., producer of antibiotics, recently installed the third General Electric automatic extraction turbine-generator at its Groton, Connecticut, plant. A 6000 KW extraction unit was installed to take fullest advantage of available high-pressure steam, and to obtain additional economical by-product power.

## PRESSURE HELD CONSTANT

The double automatic extraction turbine takes steam at 725 F, 600 psig, and extracts at 135 and at 50 psig for plant process uses in the making of terramycin and other antibiotics. Chas. Pfizer & Co.,

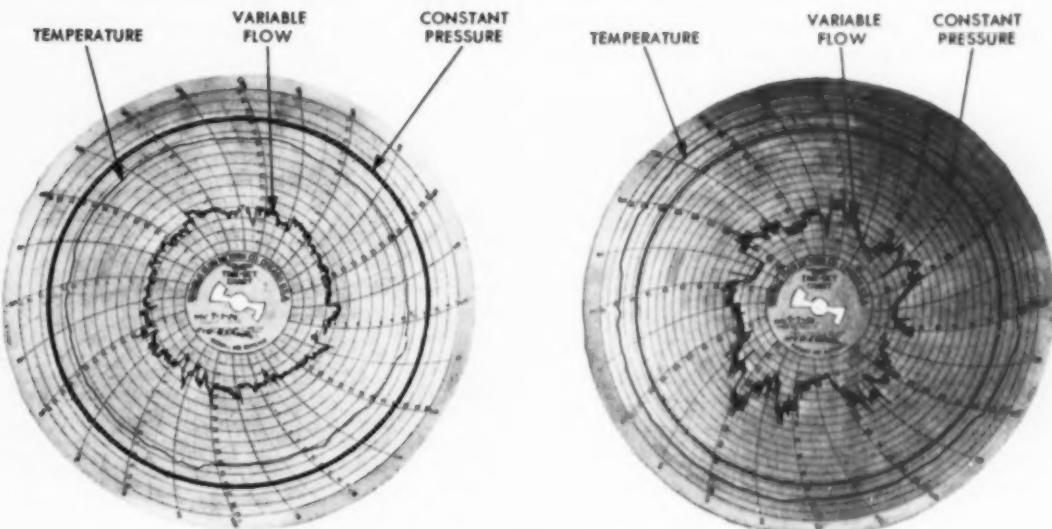
Inc. reports that accurate turbine governing holds electrical frequency constant, and keeps extraction pressures precise, even when the quantity of extracted steam varies. (See charts below.)

If your plant uses process steam, why not take advantage of G.E.'s experienced turbine engineering resources. G-E engineers will study and recommend ways for you to best utilize steam supply. Get more for your turbine dollar with G-E turbine-generators. General Electric Company, Schenectady 5, New York.

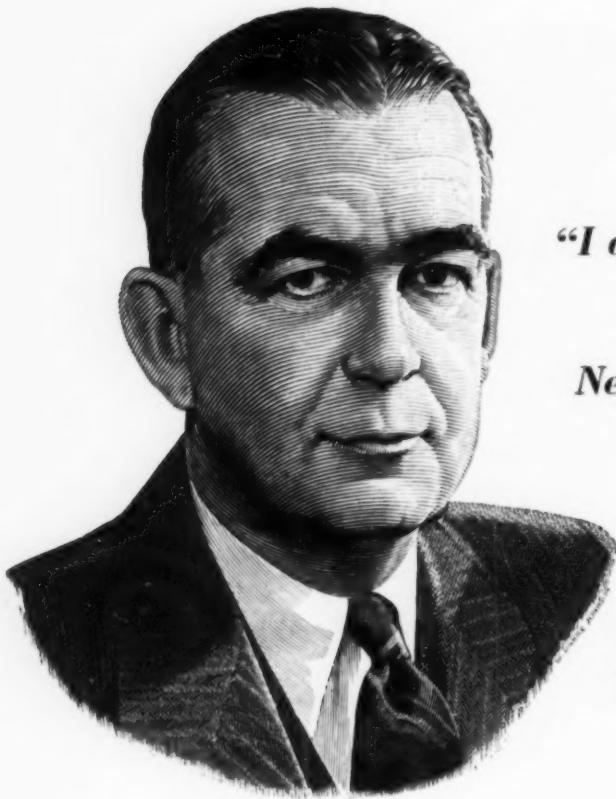


256-8

*You can put your confidence in—*  
**GENERAL**  **ELECTRIC**



Even when the quantity of extracted steam varies over wide limits, extraction pressure remains constant, as indicated on the charts above. These charts show typical performance of a General Electric double automatic extraction turbine such as the one installed at Chas. Pfizer & Co., Inc.



***"I am one of many thousands  
of the employees of  
Newport News Shipbuilding..."***

**R. I. FLETCHER**

Vice President and Comptroller  
Newport News Shipbuilding and  
Dry Dock Company

***"United States Savings Bonds are an ideal backlog investment for every employee, whatever his age or his earnings bracket. When bought automatically and conveniently through the Payroll Savings Plan they are almost 'painless' savings. I am one of many thousands of the employees of Newport News Shipbuilding and Dry Dock Company who regularly save every payday for investment in Savings Bonds through our Payroll Savings Plan. The security of the Nation rests upon the security of its individual citizens and all employees who practice the American habit of thrift are contributing to the national security as they provide for their own future."***

Fortunately for America, industry and business recognize that "the security of the Nation rests upon the security of the individual."

More than 45,000 companies offer their employees the Payroll Savings Plan. In many of these companies more than 60% of the employees are Payroll Savers—in some, participation is 75%, 80%, and higher. But, in others participation is low—sometimes less than 25%.

Why does Company A have an employee participation of 75% while Company B—about the same size, in the same industry, with the same wage scales—has less than 25% of its employees enrolled in the Payroll Savings Plan? Is it because the employees of Company B are not concerned about their future, have no interest in personal security?

Men who head up industry-wide committees for the promotion of the Payroll Savings Plan . . . members of the Payroll Savings Advisory Committee . . . State Directors of

the Treasury Department—any of these men can give you a quick answer:

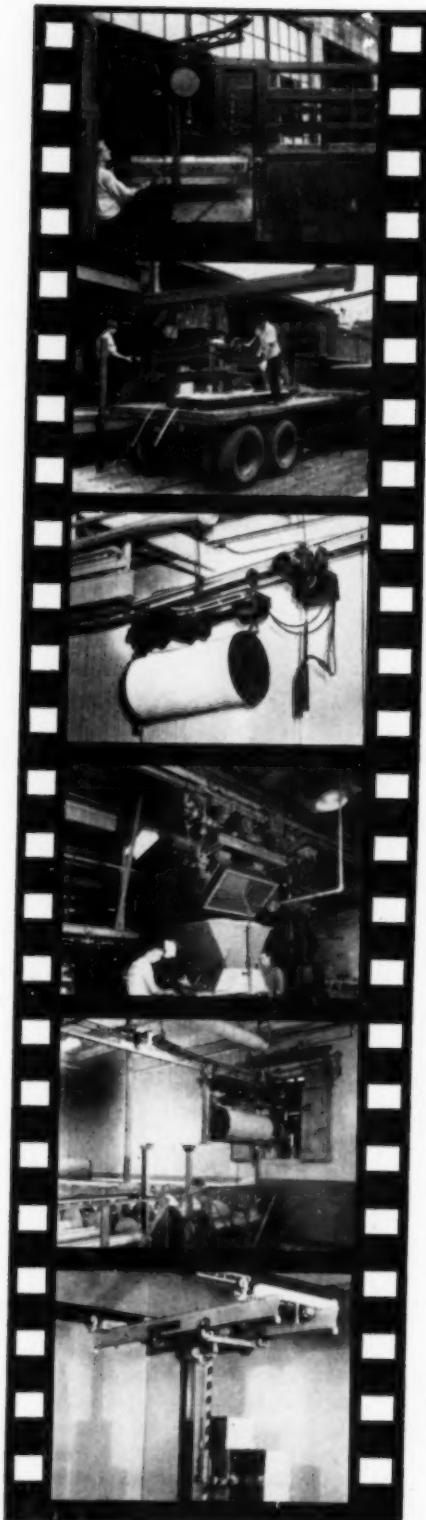
"In every company with a good Payroll Savings Plan you'll find a top executive is heart and soul behind the plan—and everybody in the company, down to the last man in a subsidiary plant, knows it. When you find a company with a poor Payroll Plan the 'top man' will tell you, 'Yes, we have a Payroll Savings Plan. . . No, I don't know how many employees are enrolled or what the average monthly saving is. Mr. \_\_\_\_\_ takes care of that.'"

Currently, upwards of 3,000,000 men and women are enrolled in the Payroll Savings Plan. The 1954 goal—9,000,000—can be exceeded if you and other executives will take a personal interest in your company's Payroll Savings Plan. Any information and all the help you need to build a successful Plan can be obtained promptly from Savings Bond Division, U. S. Treasury Department, Washington Building, Washington, D. C.

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**SOUTHERN POWER & INDUSTRY**





Quickly removes die blocks from trucks

Saves \$30 each truck unloaded

Delivers beams to another building

Automatic delivery of core sand

Automatic transfer of slasher beams

Stacker crane increases storage by 60%



a 16 mm movie that discusses  
handling problems common  
to every industry

Before you decide upon any material handling equipment, let us loan you "Up and Over". This 16 mm film shows many installations of American MonoRail overhead handling equipment. You will see hand operated to fully automatic systems—one or more that may be particularly adaptable to your operations. The film is educational, interesting, informative and shows the way to economical, safe and time-saving material handling. Your ticket of admission is only a note to us asking for a print. It will help us if you advise the exact date, as close as possible, when you wish to use it.



**THE AMERICAN MONORAIL COMPANY**

13105 ATHENS AVENUE

CLEVELAND 7, OHIO

# Make SURE machinery keeps operating

• For the solution to lubrication difficulties, or chemical feeding problems, more and more companies are turning to Manzel.

...for example:

Chemical Feeders are used throughout the oil industry to keep wells and pipelines in good, flowing condition. But, in wet gas fields corrosion frequently stops the motors that power these feeders.

To solve this problem, Manzel developed a chemical feeder with built-in automatic force feed lubrication which protects the gas motor from corrosion and insures continuous operation of the feeder.

For 50 years a leader in the field, Manzel is today a flexible, fast-moving organization with the special technical skill for meeting your needs quickly and economically. Write for further information about Manzel Force Feed Lubricators and Chemical Feeders.

# Manzel

318 BABCOCK STREET  
BUFFALO 10, N. Y.

A DIVISION OF FRONTIER INDUSTRIES, INC.

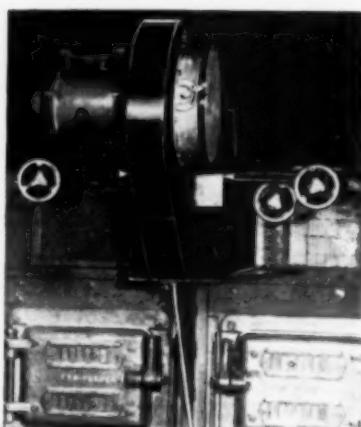


firing rate is correctly proportioned for efficient operation with correct CO<sub>2</sub> content and fuel gas temperature in the stack.

Case 34—Tennessee

## Stoker Gives More Efficiency

INCREASED steam requirements and cost of supplementary fuel prompted the Ashby Veneer & Lumber Company, Jackson, Tennessee, to check performance of the Wood Burning FLO-MATIC FYR-FEEDER Stoker manufactured by the American Coal Burner and Wood Stoker Corporation.



FLO-MATIC FYR-FEEDER wood stokers can be arranged to burn wood only, or wood and coal, or coal only.

In the fall of 1952, one of their 150 hp H.R.T. boilers was reset and furnace arranged to receive a FLO-MATIC FYR-FEEDER to burn hogged wood refuse. The spray-spread system employed for introducing hogged fuel into the furnace is a departure from the conventional "Dutch Oven" and "pile" burning of refuse fuels.

Mr. Ashby advises that the reset boiler equipped with the stoker is delivering 30% more capacity and burning fuel more efficiently than the adjacent 150 hp boiler with "Dutch Oven."

Third boiler is gas-fired. Previous to "Flo-Matic" application this boiler was in service daily; however, with the increase in firing efficiency and boiler capacity effected through "Flo-Matic" firing, gas is now used only over weekends.

# 5 B&W INTEGRAL-FURNACE BOILERS, TYPE FM



## HELP MINE SULPHUR in Louisiana Marshland

With the report that molten sulphur had begun to flow at its new plant in the Louisiana marshland, The Freeport Sulphur Company announced the success of its unique sulphur mining development, climaxing eight years of intensive research. The only "amphibious plant" of its kind in the world, it is expected to produce about 100,000 tons of critically needed sulphur a year when in full production.

Playing a major role in the unusual operations are five B&W Integral-Furnace Boilers, Type FM. Each of the boilers can provide up to 30,000 lb steam per hr for turbine-driven blowers, turbine-electric generators, and to heat sea-water for the sulphur mining operation. The water is preheated by direct contact with the boiler flue gas passing through heat exchangers.

As part of a "plant" including shops, warehouses, and offices, and described as the "strangest craft since Noah's Ark", these B&W boiler units sit atop a 200-foot, specially-constructed steel barge towed to and resting on an oyster shell base laid on the bottom of Bay Ste. Elaine.

Cut-away view of typical B&W Integral-Furnace Boiler, Type FM, available in standard sizes for loads of 2900 to 28,000 lb per hr at steam pressures to 235 psi . . . also available for higher pressures.

They were chosen to assure efficient, economical performance under particularly arduous service conditions . . . are surrounded by a salt-water marsh and almost completely exposed to salt-water spray and other destructive actions of weather and climate.

Whether for sulphur mining or oil refining, for heat, process, or power requirements, versatile B&W Integral-Furnace Boilers, Type FM, are now in service or on order for more than 50 different industries and other users, with a total steam capacity exceeding  $6\frac{1}{2}$  million lb per hr. The Babcock & Wilcox Co., Boiler Div., 161 E. 42 St., New York 17, N. Y.

### COST-SAVING FEATURES

- Saves erection time and cost
- Has a wide range of service
- Handles quick load changes
- Dual steaming
- Low maintenance
- Easy accessibility
- Built-in for continuous service
- Burns off-gas fuel gases
- Saves fuel
- Saver factor

**BABCOCK  
& WILCOX**



BOILER DIVISION

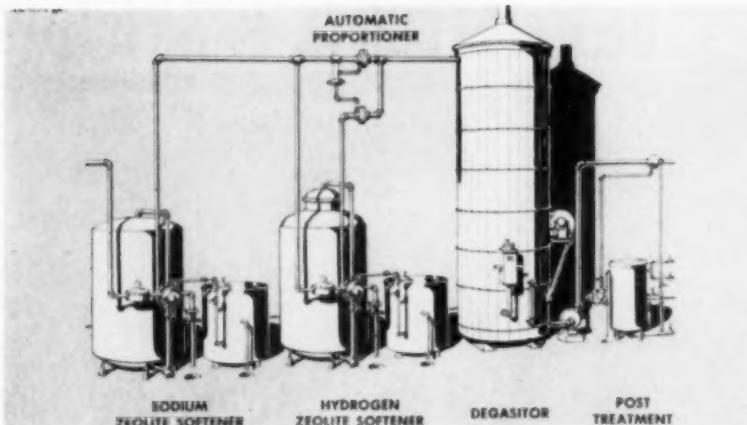
G-587

## Case 35—Texas

### Scale, Corrosion and Alkalinity Reduced

HERE is a typical case study covering improved boiler plant operation following installation of a "Split-Stream Dealkalizing" system of boiler water conditioning at Taylor Oil and Gas Company, Corpus Christi, Texas.

With the system which is graphically illustrated (Elgin Softener Corporation), blended effluents from sodium and hydrogen zeolite water softeners, followed by degasification, gives zero soft water in which total solids and alkalinity are reduced and  $\text{CO}_2$  is removed. Boiler equipment is kept clean and free from scale formation, alkalinity is kept in proper proportion



Graphic illustration of "Split Stream Dealkalizing" boiler water conditioning system at Taylor Oil and Gas Company, Corpus Christi, Texas.

to total dissolved solids, and blow-down is reduced approximately 35% to give substantial operating savings.

The system has eliminated the costly destruction of return line corrosion. Priming and foaming

has been prevented. And as an extra dividend, post-treatment costs are cut to a minimum.

## Case 36—Louisiana Pipe Line

### Full Flow Lube Oil Filters Protect Compressor Stations

THE United Gas Pipe Line Company, world's largest handler of natural gas, recently completed more than a thousand miles of natural gas pipe lines, many sections

30" in diameter. The construction job is part of a three-year expansion program, largest in the company's history.

The new pipe lines were laid out

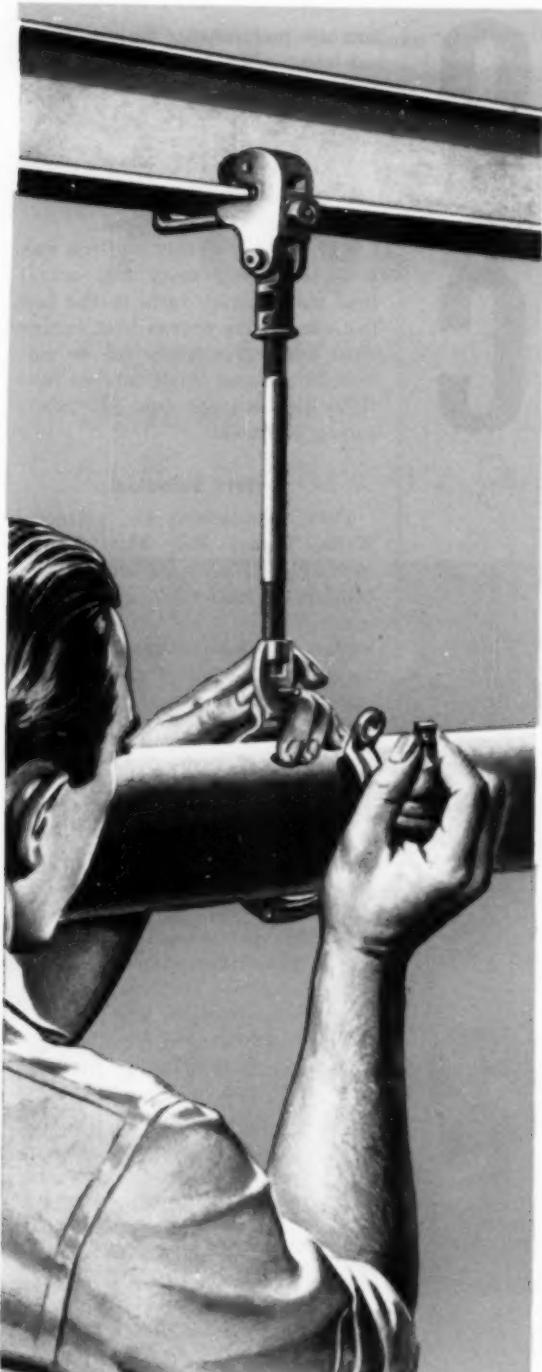
like a grid extending from gas fields in South Texas and off the coast of Louisiana up into North Louisiana and North Mississippi. The project included the construction of more than 25 miles of large diameter pipe line into the Gulf of Mexico. Eight new compressor stations were built, totaling 64,000 hp, to help move natural gas through the enlarged system.

The key to trouble free service

Interior of auxiliary generator building showing Ingersoll-Rand engine and lube oil filtration equipment consisting of PECO Partial Flow Filter on left and PECO Full Flow Filter in center.

Cooper-Bessemer Angle-Compressor foundations with oil cooler, and PECO Full Flow Oil Filters. Both views are in the Jackson, Mississippi Compressor Station of United Gas Pipe Line Company.





## Right for the job and priced right!

There's nothing sensationaly "tricky" about this pipe hanger. It's just the most practical and inexpensive way of hanging pipe for a great many jobs. Complete assembly includes a split pipe ring and socket, rod, extension piece and universal I-beam clamp. Available for pipe from  $\frac{1}{2}$ " to 8", for loads from 75 to 1510 lbs.

It is well worth remembering that a good piping job is too important to jeopardize with improvised or inadequate pipe hangers and supports. You can get from Grinnell just the right pipe hanger for any job within the shortest possible time at the lowest cost consistent with quality.

Grinnell has the most complete line of pipe hangers, extensive manufacturing facilities, warehouses across the country, and jobbers in almost every city and town.

**UNIVERSAL SIDE I-BEAM MALLEABLE IRON CLAMP** (Fig. 225) . . . Used on American Standard I-beams as well as wide flange beam sections. One of 14 different Grinnell beam clamps to meet varying specifications.



**MALLEABLE IRON EXTENSION PIECE** (Fig. 157) . . . Bolts into Universal Side I-beam Clamp (Fig. 225) and other malleable iron clamps to receive hanger rod. Provides for adjustment of rod.



**MALLEABLE IRON SPLIT PIPE RING AND SOCKET** (Fig. 107R) . . . Once hanger rod is turned to proper adjustment and the attached half of the ring is snugged against the pipe, the other half of the ring is swung up into position and bolted. For 13 pipe sizes,  $\frac{1}{2}$ " to 8", for loads from 75 to 1510 lbs.



# GRINNELL

WHENEVER PIPING IS INVOLVED



Grinnell Company, Inc., Providence, Rhode Island

\* Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports  
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

# ELECTRO

*extra*

# DYNAMIC

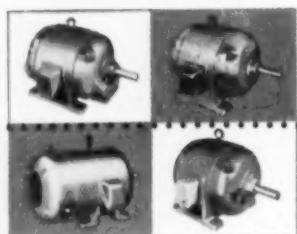
*dependable*

## INDUSTRIAL MOTORS



Every Electro Dynamic motor is built with  
EXTRA INSULATION in stator slots and between phases  
EXTRA IMPREGNATIONS and bakings of the  
wound stator  
EXTRA HIGH-FREQUENCY TESTING  
of insulation between turns

**From 1 to 250 Horsepower** (N.E.M.A. STANDARDS)



Also a complete line of Direct Current motors and generators

**ELECTRO DYNAMIC**  
DIVISION OF GENERAL DYNAMICS CORPORATION  
BAYONNE, NEW JERSEY

and low maintenance in any internal combustion engine is proper conditioning of lubricating oil. Therefore the engineers of United Gas Pipe Line Company selected full flow oil filters in addition to the customarily used partial flow or bypass filters.

The reason for this decision was that laboratory tests and actual field performance tests in the last five years have proven that engine wear and maintenance can be materially reduced if all foreign particles are removed from the lubricating oil stream.

### Filters Selected

Perry Equipment Co. (Mineral Wells, Texas) Full Flow Filters were chosen for a majority of the compressor stations for several reasons. The rectangular case permitted installation immediately adjacent to the end of the concrete compressor foundation with a minimum of floor space occupied and a reduction in the connecting piping. Also the PECO "Filter-Tex" filter element being a three way blend of cotton, rayon and wool is capable of micronic filtration to the point of removing colloidal carbon. Wool is used largely for its moisture retention properties and with the cotton to absorb foreign particles. The rayon serves to bind the other two ingredients together and maintain the uniform, graded density structure by preventing channeling, shrinkage and collapse.

As an indication of the full flow filter requirements, a total of 54 of the 4" diameter by 36" long Filter-Tex elements are used in a full flow filter for a 2000 hp engine with an oil circulation of 350 gpm. For a four-cycle engine of 1320 hp with a 125 gpm oil circulation, a total of 30 elements are used per filter.

As is customary on these large, slow speed engines, a by-pass or partial flow filter containing Fuller's Earth is also used to remove the acids, gums and resins, and to maintain the lube oil within accepted neutralization number limits. Operating life of the by-pass filter media is materially increased when Full Flow Filters are used, as the dirt and foreign particle load is no longer imposed on the by-pass filters.

# 24 hours a day 7 days a week

Detroit RotoGrate  
Stoker in  
Ladish Malting Co.



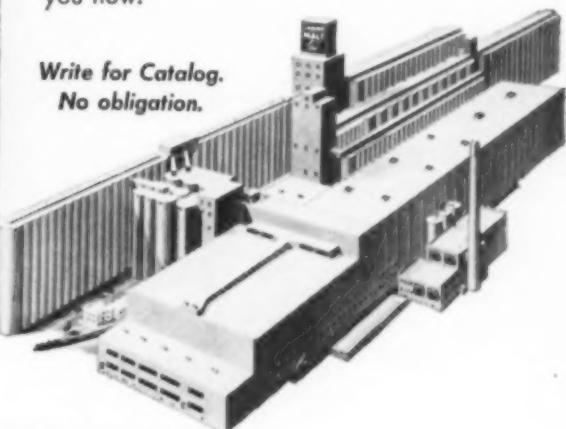
Exceptional reliability and very high availability are an utmost necessity in malt-  
ing plant operation.

Enormous quantities of steam are needed in the Jefferson Junction, Wisconsin, plant of the Ladish Malting Co. for power and process. Ten million bushels of malt are manufactured annually. Steam generating equipment operates 24 hours a day and 7 days a week.

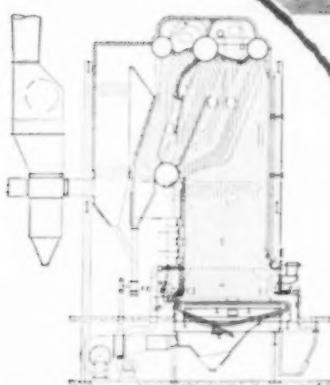
Difficult firing problems are always best solved by the use of Detroit RotoGrate Stokers.

Why not let them start saving money for you now.

Write for Catalog.  
No obligation.



Detroit RotoGrate Stoker applied to a Babcock & Wilcox-4 drum Stirling Boiler with Superheater and Economizer Capacity 75,000 pounds. 410 psi 600° F.



**DETROIT STOKER  
COMPANY**

GENERAL MOTORS BLDG., DETROIT 2, MICH.  
WORKS IN MONROE, MICH.

### Case 37—S. C. Textile Mill

#### Underfeed Stokers

In January, 1951, the Chesnee Mill, Chesnee, South Carolina, owned and operated by Reeves Brothers, Inc., Spartanburg, South Carolina, installed two iron Fireman Coal-Flow underfeed stokers in boilers producing steam both for processing and heating. Savings in fuel and labor were analyzed recently by J. H. Wyatt, assistant treasurer of the company.

Before installation of the stokers, fuel costs for the Reeves Brothers' Chesnee Mill were running \$13,416 annually; these costs since have been cut to \$10,400, with a saving in direct fuel expense alone of \$3,016 a year. Besides, Wyatt noted in this analysis, "labor for firing the boilers has been reduced from \$187.68 per week to \$134.04 per week"—a labor saving of \$2,789.28 a year, or a combined



Iron Fireman Coal-Flow underfeed stokers in Reeves Brothers' Chesnee Mill, Chesnee, S. C. Since the coal conveying system is an integral part of the stokers, need for manual handling of fuel or for separate automatic conveyor equipment is eliminated.

annual total of \$5,805.28.

"Due to the automatic nature of the Iron Fireman equipment," Wyatt said, "the amount of steam produced is more closely related to the demand. This gives us peak

production of steam when needed, and eliminates excess firing during periods of low demand. As a result, the boiler efficiency is improved, and the consumption of fuel is reduced."

### Case 38—North Carolina Furniture Plant

#### Collectors Solve Fly Ash Problem

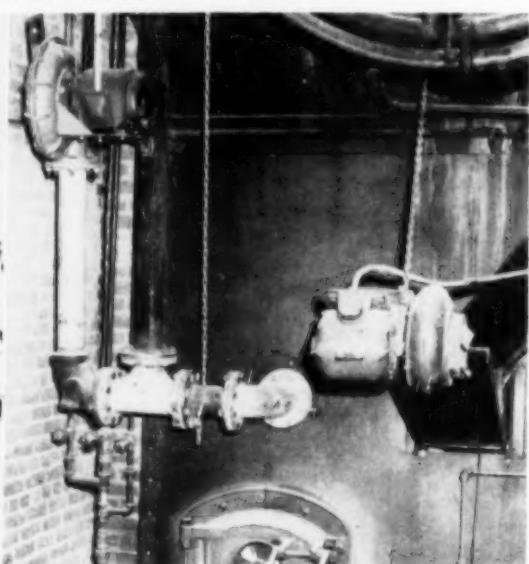
FUEL used by the United Furniture Corp., Lexington, N. C., in its boilers is entirely its own wood

waste—no fuel of any other kind is used to supplement it. As a result, large quantities of fly ash

were released into the air, some of which got into the finishing room of the plant and made it necessary to refinish considerable amounts of furniture.

The wood cinders also collected on the roof of the plant, resulting in a high roof-maintenance cost.

Two Fly Ash Arrestor Corp. collectors installed at the United Furniture Corp. plant in Lexington, N. C. Rejection equipment for returning trapped fly ash to the boilers consists of a 2 hp motor for each collector, direct-connected to a high pressure fan; a special Venturi section; and a cast iron discharge pipe to the furnace.





***Meet the man* you can call  
with confidence to solve your  
thermal insulation problems**



To insulate outdoor tanks with complete weather protection, these skilled J-M applicators follow a specification developed by Johns-Manville. Here they are fastening J-M Asbestocite® Sheets over J-M Zerolite® Insulation. J-M 85% Magnesia Insulation is also widely used for this type of equipment.

## ***He is your J-M Insulation Contractor... the man with the world's most complete insulation engineering service***

"Insulation is no better than the man who applies it." Today, with rising fuel and maintenance costs, it is especially important to place your insulation job in skilled hands. The scientific application of J-M quality insulations by J-M Insulation Contractors will assure you of the maximum return on your insulation investment for years to come. Moreover, you get undivided responsibility for all your insulation requirements.

**1. You get dependable materials—**  
Johns-Manville manufactures a complete line of insulations for every service temperature from minus 400°F to plus 3000°F. From them your J-M Insu-

lation Contractor can select the right insulation for the most dependable service on your job. To develop new and improved insulation materials Johns-Manville maintains the J-M Research Center—largest laboratory of its kind in the world.

**2. You get dependable engineering**  
—For 95 years Johns-Manville has been accumulating insulation engineering experience. J-M Insulation Engineers are called upon to solve insulation problems of every type and magnitude, in every industry. Since your J-M Insulation Contractor works closely with J-M Insulation Engineers, he brings to every job a high degree of

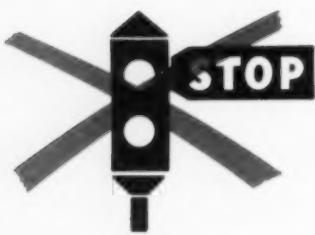
training, skill and experience.

**3. You get dependable application**  
—Johns-Manville has set up a nationwide organization of J-M Insulation Contractors to serve you. These Contractors maintain staffs of insulation engineers as well as skilled mechanics thoroughly trained in J-M's proved application methods. You can have absolute confidence in their ability to apply J-M insulations correctly for trouble-free performance.

For further information and the name of your J-M Insulation Contractor, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont. **JM**  
\*Reg. U. S. Pat. Off.

# **Johns-Manville FIRST IN INSULATION**

MATERIALS • ENGINEERING • APPLICATION



# Pacific PUMPS

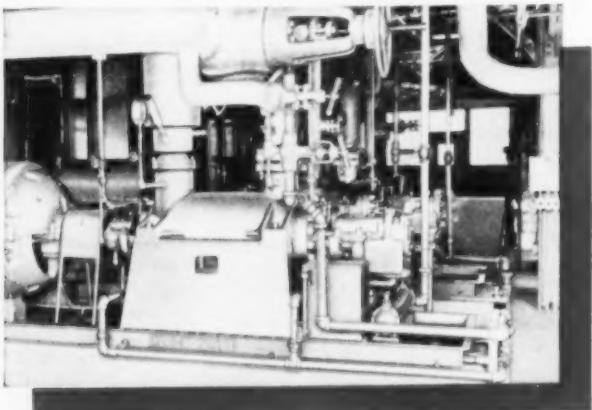
*Eliminate Stop Signs...*

**Provide Constant  
Power Generation Traffic!**



operating and standby. For more than two decades, Pacific has built feed pumps for this exacting service in central stations and industrial power plants on four continents.

Sizes installed range from the midgets of less than 50,000 lbs. per hour to the giants having a capacity of 1,000,000 lbs. per hour. The operating discharge pressures range from 200 to 2500 psig. More than 50 units are operating at discharge pressures above 2000 psig.



*To insure GO in your central station or industrial power plant, specify boiler feed pumps by Pacific Pumps, Inc. For more information, write for Bulletin 109.*

**PACIFIC**  
*Precision, Built*  
**PUMPS**

**Pacific Pumps inc.**

ONE OF THE BREAKER INDUSTRIES

HUNTINGTON PARK, CALIFORNIA

Export Office: Chanin Bldg., 122 E. 42nd St., New York  
Offices in All Principal Cities

BF-1B

Gutters and drains on the roof were also stopped up by the cinders, and there was danger that the fly ash given off would create a neighborhood nuisance.

When the management of United Furniture Corp. decided to make a determined effort to end the fly ash problem, Jack Myers, United's superintendent, visited another North Carolina plant which had successfully coped with the problem by an installation of Multiple Cyclone Fly Ash Collectors. As a test, Mr. Myers laid several cotton sheets on the ground next to the plant, where they would normally be expected to be covered with fly ash in a short time. When the sheets were practically untouched after a whole day's exposure, there was no doubt of the necessary steps to take.

United Furniture Corp. has two Combustion Engineering, Inc., boilers, each rated at 550 hp. Each boiler has a heating surface of 2,272 sq ft, with 3½ in. diameter tubes. Both boilers are equipped with McBurney wood waste feeders.

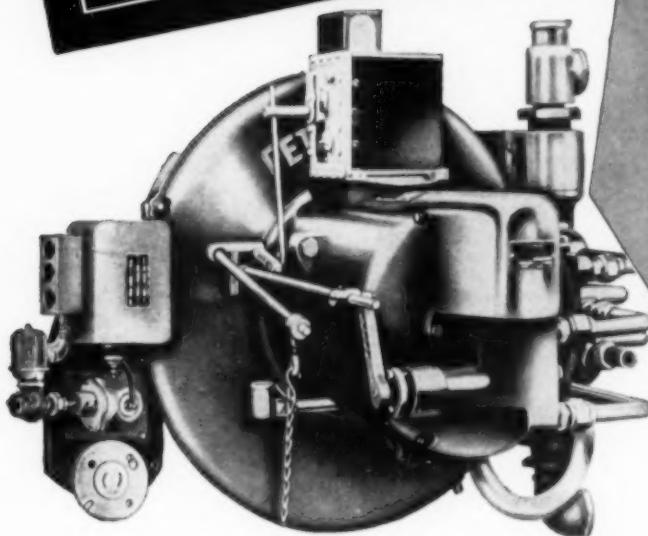
#### Equipment Installed

Two Multiple Cyclone Fly Ash Collectors, model MTS-24-9CYST, manufactured by Fly Ash Arrestor Corp., Birmingham, Alabama, were installed. Fans for the collectors are size 6.5 SISW, type SR, each powered by a 20 hp, 1750 rpm General Electric motor, with V-belt drive. The motors are splash-proof, and equipped with weather-proof belt guards, so that no shelter is needed for them.

The fly ash collectors were erected on extensions from the original boiler supporting steel, with no building changes necessary. All equipment, including supporting structure, connecting ductwork, and stub stacks, was engineered and fabricated at Fly Ash Arrestor Corp.'s Birmingham plant, so that on arrival at the site it had only to be hoisted into place and bolted together by United Furniture Corp.'s own personnel. No special erection crew was required.

The equipment is designed to handle 550 hp per boiler, based on 12 per cent CO<sub>2</sub>, 600 F stack temperature, when fired with dry wood waste. Guaranteed collection efficiency is 95 per cent total solids,

Are steam costs  
YOUR responsibility?



MODERNIZE WITH A  
**PETRO**  
INDUSTRIAL OIL BURNER

*and cut  
steam costs!*

### HERE'S WHAT PETRO WILL DO FOR YOU:

#### LOW FIRST COST

Petro industrial oil burners are designed and built to modernize the firing of your present boilers. This means that you save substantially on initial installation costs—yet enjoy the efficiency, the dependability, and the complete automatic operation that has been traditional with Petro burners for over 50 years.

#### LOWER FUEL COSTS

A Petro oil burner's economy is unchallenged. You save two ways. First, you save on fuel cost, because heavy oils cost less per gallon and have higher heat value. And second, a Petro burner is designed to burn these low-cost, heat-rich heavy oils with complete dependability. Whether the oil is thick or thin a Petro feeds it steadily under precise automatic control. You get more efficient firing.

#### UNUSUAL FLEXIBILITY

Here is another Petro value. Under automatic modulating

flame control it is extremely flexible in following fluctuating steam demands. If yours is a problem of "high and low" steam requirements—then a Petro burner is your answer. It follows the load without hesitation, and throttles down to a steady low burning rate if desired.

#### LOWER OPERATING COSTS

Petro industrial oil burners and combustion oil-gas burners are completely automatic. They require a minimum of supervision. Boiler rooms stay clean. The simple, sturdy design of the Petro burner and its easy accessibility reduce upkeep to a minimum—save you money year after year.

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- 8 **PERIODIC CHECK-UPS**—Your Bird-Archer Service Engineer makes regular personal call-backs on your plant to be sure you get the best possible results.

FOR COUNSEL BACKED BY OVER SIXTY YEARS OF EXPERIENCE CALL BIRD-ARCHER'S QUALIFIED WATER TREATMENT ENGINEERS. CONSCIENTIOUS, PERSONAL ATTENTION AND HIGHEST QUALITY CHEMICALS.

DA-202

Engineering Plus Chemistry Equal BIRD-ARCHER Service

based on typical wood cinders analyzing 20 per cent minus 325 mesh standard Tyler screen.

The installation of these collectors has completely eliminated their fly ash problem, according to officials of United Furniture Corp. Even though wood waste is burned at all times, smoke can rarely be detected coming from the stacks, and scarcely a trace of wood cinders can be found on the roof or other parts of the plant.

Case 39—Florida

### Sludge Trouble

FOR several years, one of the leading Florida oil dealers has been selling a blended #5 oil which has given considerable trouble from sludge—especially during the summer months. As the company maintains customers' boiler plants on a contract basis, they have had trouble and expense pumping sludge out of tanks, cleaning strainers, burners, etc.

Over two years ago, H. K. Wilson, of St. Petersburg, Fla., state representative for the American Sand-Banum Co., induced them to adopt Sabanol Fuel Oil Homogenizer for addition to all oil sales. The product has entirely overcome this trouble. They make no charge for the addition of the Sabanol as it saves them more than it costs, besides giving the customer much better combustion and operation. The product is suitable for all grades of fuel oil in burners or diesel engines.

### More Information Available

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N.E., Atlanta 5, Georgia. There is no obligation.



**BRONZE "WHITE STAR" GATE VALVE**  
(Fig. 375) for 200 pounds W.S.P.  
Union Bonnet with inside screw rising  
stem. Renewable "Powellium"  
Nickel-Bronze wedge.



**INTEGRAL BONNET OFFSET GLOBE VALVE**  
(Fig. 1331-A). 1500-pound. One-piece  
construction eliminates possibility of  
leakage between body and bonnet.  
Sizes  $\frac{1}{2}$ " to 2", inclusive.



**PRESSURE SEAL GATE VALVE** (Fig. 19003). 900-pound. Many proven advantages and exclusive features. Pressure Seal valves are available in Non-Return, Check, Globe and Angle Patterns.



## AN OPEN AND SHUT CASE

All the evidence is in. Powell Valves have a record of dependability since 1846. Powell makes more types of valves, has probably done more valve research and solved more valve problems than any other organization in the world.

On the basis of such overwhelming evidence, can your verdict be anything but a decision in favor of Powell Valves? See exhibits following.

**SWING CHECK VALVE** (Fig. 559) for 125-pounds W.S.P.  
Iron body, bronze mounted. Regrindable, renewable  
bronze seat and disc. Sizes 2" to 16", inclusive.



**POWELL VALVES**

## Demineralization Equipment Solves Boiler Feed Make-up Water Problems

By J. D. Yoder, Vice President  
The Permutit Company

FEEDWATER treatment in the early days of power development consisted mostly of cure-all mixtures and home-made remedies. Some did a good job while others benefited no one except the producer or manufacturer. Now, engineers and chemists together have developed the business into an exact science which seeks information to extend boiler design limits as well as to solve immediate problems.

Formerly, when the percentage of make-up was small, many design and operating engineers were of the opinion that water softening equipment was not justified because the total solids introduced into the boilers were relatively minor and could be taken care of by suitable internal treatment. However, recent developments now make it possible to produce a demineralized water with substantially the same constituency as a condensate from a commercial evaporator or equivalent to a single distilled water.

Commercial developments of

high capacity cation and anion exchange resins, together with modern demineralization apparatus, now offers the possibility of producing economically, water low in electrolyte content and dissolved silica. In the majority of future installations, low cost demineralization will be used in place of expensive evaporators for the treatment of high pressure boiler feedwater. (For engineering details, check "Demineralization—Make-up Water for Steam Power Plants," SP&I for May, 1953, pages 74-78.)

Demineralization unquestionably provides a better effluent than water softening apparatus and justifies its higher cost for higher boiler pressures. The trend for many years has been toward the use of better boiler feedwater, and this trend will undoubtedly continue, resulting in increased usage of demineralizing apparatus. The results from the equipment installed at this mill, speak for themselves. They have reduced outages of turbines and insured trouble-free operation for years to come.

Typical of modern applications for the treatment of boiler feed make-up water is the installation in

Two horizontal Permutit type Precipitators shown here, each rated at 12,000 gpm capacity, treat 24,000 gpm at the paper mill.



the plant of a large Southern paper mill, a manufacturer of high-grade paper products.

### Demineralization of Water

For this plant, demineralization equipment was supplied to treat the make-up water for boilers evaporating 450,000 lb/hr at 850 psi, 825 F temperature. The water used is a creek water which has received a preliminary clarification treatment to fit the general mill requirements.

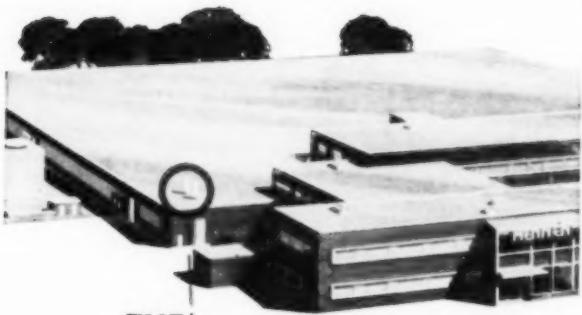
As shown in the schematic layout of the water treating plant, the creek water is pumped into a mixing flume which proportions this supply between the two Permutit Precipitators, each of 12,000 gpm capacity. The coagulating chemicals such as alum, soda ash and clay are fed to the water in the mixing flume. Here, the treated water is filtered upwardly through a sludge blanket.

The 18,000 gph make-up for boiler feed is taken from the mill supply, passed through pressure filters and is delivered to an automatically operated double unit demineralizing plant. Each pair of units is capable of delivering 18,000 gallons of water per hour so that when one set of units is out for regeneration, the second set supplies the boiler feed make-up. Each pair of units includes one 8 ft diameter cation exchanger and one 8 ft diameter anion exchanger.

### Ion Exchangers

When one pair of exchangers has removed dissolved silica solids to its rated capacity, a motor closes an electrical circuit to automatically put into service the second pair and to regenerate the first pair. This motor rotates a multiport inlet valve sequentially to the respective positions of backwashing, adding the regenerant solutions, rinsing to waste, and restoring the units to service.

The cation exchange resin, Zeo-Karb H, is regenerated with sulphuric acid to replace the calcium magnesium and sodium of the raw water with hydrogen ions. The anion exchange resin, Permutit S-2, which absorbs silica as well as chloride, sulfate and carbonate ions, is regenerated with caustic



**THE  
MENNEN CO.**

*Chooses*



## CYCLONIC COMBUSTION

### TO SOLVE A COMPLEX STEAM PROBLEM

The Mennen Company chose for their new ultra-modern plant and general office building in Morris Township, N. J., two 350 h.p. Cyclotherm Steam Generators to provide dependable steam for three separate and vitally important factors in their plant operation.

#### 1. FOR PRODUCT PROCESSING

Constant steam is required for production in processing the many Mennen products. Cyclotherm has proven its reliability in thousands of installations throughout the world where steam loads vary, maintaining its high rate of efficiency and low rate of fuel consumption.

#### 2. FOR AIR CONDITIONING

The Cyclotherm Steam Generators will provide 6,840 lbs. of steam per hour required to run two 180 ton absorption refrigeration units for Mennen's unique air conditioning system.

#### 3. FOR PLANT AND OFFICE HEATING

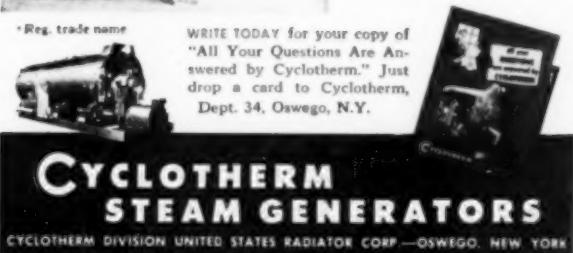
To provide efficient heating for the 264,000 sq. ft. of plant and office space, Cyclotherm was again the first choice.



FIND OUT HOW Cyclotherm Steam or Hot Water Generators can give you: Guaranteed minimum efficiency of 80%; Full power from a cold start in 15 to 20 minutes; Increased savings on fuel and maintenance and many other advantages that are essential in your complex steam problem.

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4 model sizes cover total load range from 60 to 10,000 pounds, each size having travel range of 3 inches.

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Easier and less costly to install properly, either as hangers or seats. No turnbuckles required.

Actual load, travel, variability and natural frequency of vibration are all indicated instantly on scale plate for a given pipe position.

Complete engineering and design service available to you through our affiliated company: **UNIVERSAL PIPING, INC.**

Represented by Mr. Ira Pulaski, Suite 1447-2025 Peachtree Street N.E., Atlanta, Ga. Messrs. White & Whittfield, Gulf States Distributing Corp., 4003 Westheimer, Houston 6, Texas. Canadian Affiliate, Unico Piping & Engineering, Ltd., 70 King Street, St. Catharines, Ontario, Canada.

**C. H. LEIBFRIED Manufacturing Corp.**  
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### Creek Water Analysis Before and After Demineralization

Substance	Symbol	Creek Water ppm Before	Creek Water ppm After
Calcium (Ca)	as $\text{CaCO}_3$	3	0.1
Magnesium (Mg)	as $\text{CaCO}_3$	1	0.1
Sodium (Na)	as $\text{CaCO}_3$	48	1.2
Bicarbonate ( $\text{HCO}_3^-$ )	as $\text{CaCO}_3$	12	1.2
Chloride (Cl)	as $\text{CaCO}_3$	10	0.1
Sulfate ( $\text{SO}_4^{2-}$ )	as $\text{CaCO}_3$	30	0.1
Carbon Dioxide ( $\text{CO}_2$ )	as $\text{CO}_2$	5	0
Silica ( $\text{SiO}_2$ )	as $\text{SiO}_2$	7	0.1

### Costs for Chemical Treatment

	ppm	Cost c/lb	\$ per Million lb of Water
Sulphuric Acid ( $\text{H}_2\text{SO}_4$ )	132	1.0	1.32
Caustic Soda ( $\text{NaHCO}_3$ )	194	3.0	5.82
Chemical Cost per Million Pounds of Water			\$7.14
Chemical Cost per 1,000 Gallons of Water			\$0.059

soda. This replaces the chloride, sulfate, bicarbonate and silica with hydroxyl ions. The resultant water, with essentially all minerals removed, is the equivalent of distilled water.

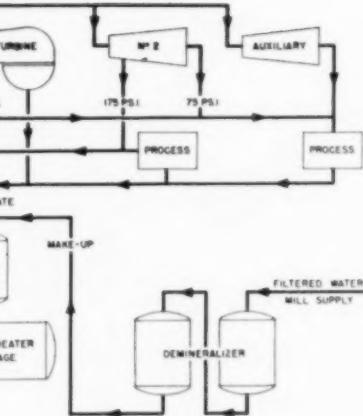
### Cost Comparisons

For a comparison of the analysis of the creek water before and after demineralization, refer to the accompanying table.

Although the cost for deminerali-

zation is only a small fraction of the cost of distillation, it is relatively high as compared with the cost of some other methods of water treatment such as the hot lime zeolite process. Demineralization, however, makes possible supplying the boiler with the same character of water as has previously been supplied only to power plants fed with surface condensate and evaporated makeup.

The water supply for this South-



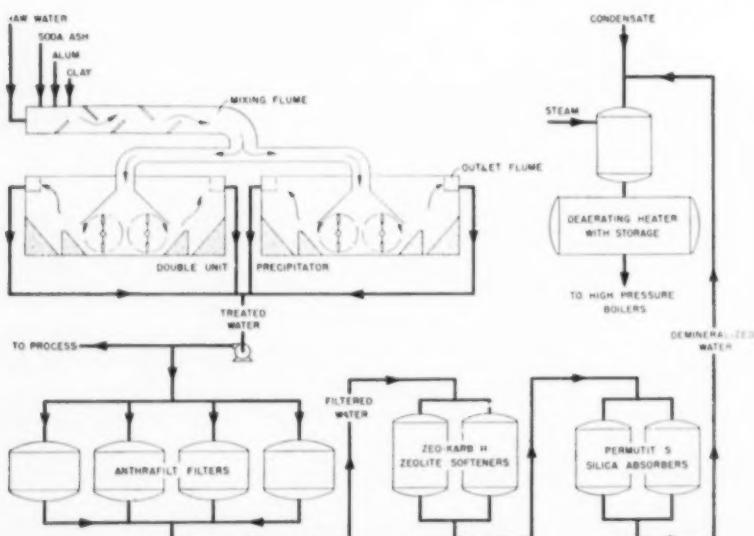
Schematic diagram shows the steam and feedwater cycle. The boiler supplies high pressure steam to three turbines. No. 1 turbine exhausts to a surface condenser and steam is extracted at 175 and 75 psi. The No. 2 turbine exhausts to 75 psi and has no extraction stage at 175 psi. The auxiliary turbine exhausts to 75 psi and is not equipped with an extraction stage.

ern paper mill is relatively low in mineral solids so that the costs for equipment and chemicals for treatment of the water supply are relatively low. The cost of the chemical treatment is fairly proportional to the total solids to be removed. An accompanying table lists costs for chemical treatment.

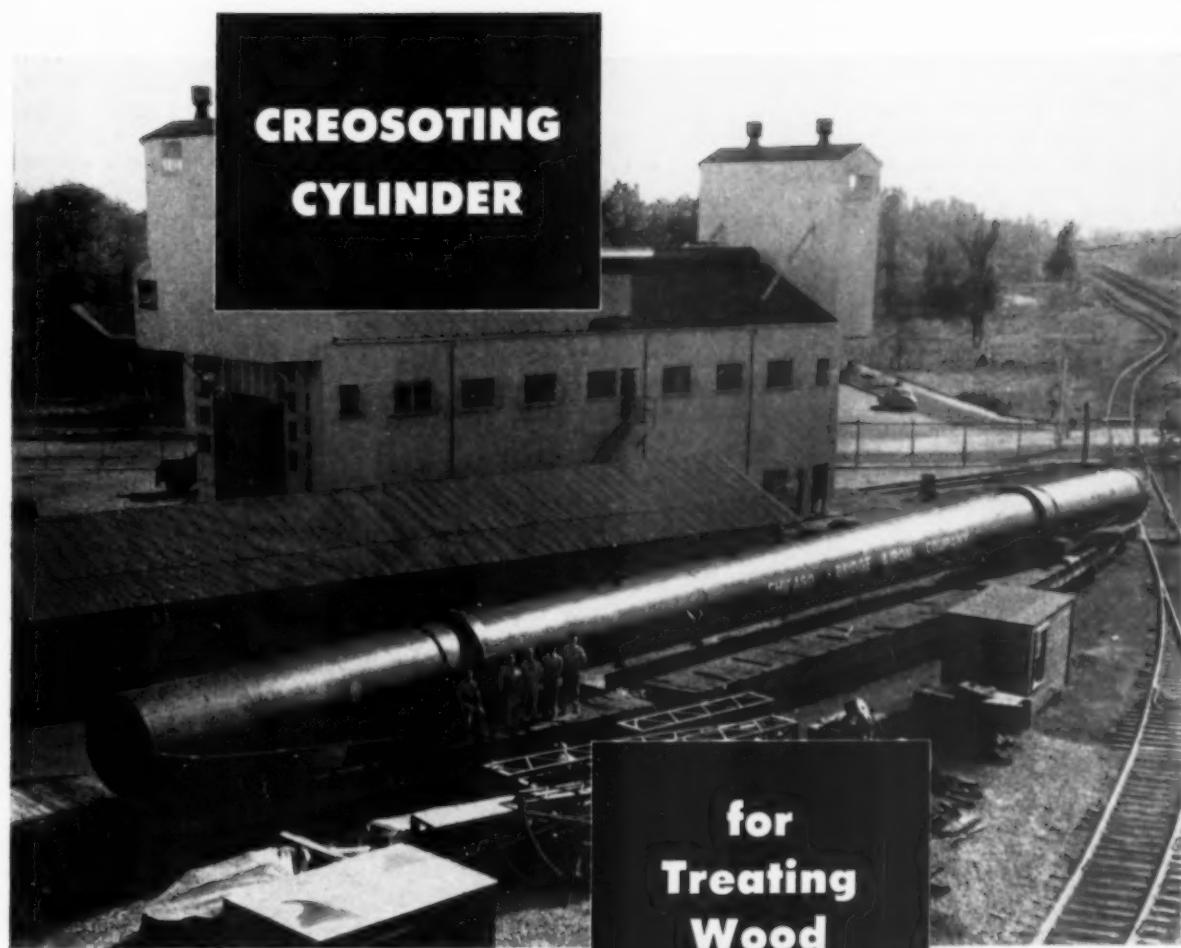
Officials at the paper mill have stated that they are obtaining excellent results from the demineralizing plant and that it is their intention to utilize demineralizing for all of their modern boiler installations. Advantages such as savings in blow-off, higher quality of steam, no trouble with scale in boilers nor in turbines have been cited.

### Quality Water Essential

Continuing, they state with great emphasis that the importance of good water, and its need, is much greater for the higher pressure boilers. This is largely because at pressures above 600 psi, there is a noticeable tendency for a portion of the silica of the concentrated boiler feedwater to volatilize and pass off with the steam. As the steam is rapidly cooled in its passage through the turbine, the silica becomes less volatile and crystallizes or precipitates on the turbine blades. This turbine deposit is very difficult to remove. It reduces effi-



Schematic layout of the water treating plant. Shown are the chemical feeds, the Permutit Precipitators, filters, zeolite water softeners, silica absorbers and the deaerating heater.



The 6-ft. 4-in. diam. by 153-ft. creosoting cylinder shown above is a typical example of the steel plate work that we are equipped to build in our shops. It has already been installed at one of the T. J. Moss Tie Company's plants and is being used to creosote forest products under pressure.

At our four strategically located plants—Birmingham, Chicago, Salt Lake City and Greenville, Pa.—we have facilities to design, fabricate and build structures for a wide range of service. We are equipped to x-ray welded joints, stress-relieve completed or partially completed structures, and pickle and paint fabricated steel plates. Write our nearest office for estimates or quotations on storage tanks or steel plate work to meet your needs. There is no obligation on your part.

*6-ft. 4-in. diam. by 153-ft. creosoting cylinder built for the T. J. Moss Tie Company. It is used to creosote forest products under pressure.*

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Los Angeles 17. 1545 General Petroleum Bldg.  
New York 6 ..... 3312—165 Broadway Bldg.

Philadelphia 3. 1646—1700 Walnut St. Bldg.  
Pittsburgh 19 ..... 3252 Alcoa Bldg.  
San Francisco 4 ..... 1531—200 Bush St.  
Seattle 1 ..... 1345 Henry Bldg.  
Tulsa 3 ..... 1628 Hunt Bldg.

In Canada—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

ciency of the turbine and increases turbine outages, frequently at great expense.

Generally, the silica does not volatilize appreciably at boiler pressures of 600 psi and lower, so that for these pressures, demineralization is not usually used. It is considered good practice however, to apply demineralization for higher pressures, as in the case of this mill, which is 850 psi.

Contributing factors which determined the selection of demineralization at the paper mill were the low solid content in the water and a low bicarbonate alkalinity.

Since the water has only 12 ppm bicarbonate alkalinity, no degasser or vacuum deaerator was required to remove excess carbon dioxide gases. The water is pumped directly through the cation and anion exchange units to a storage

or deaerating heater. The steam and feedwater cycle is diagramed. Here, the boiler supplies high pressure steam for three turbines. No. 1 turbine exhausts to a surface condenser and steam is extracted at 175 and 75 psi. The No. 2 turbine exhausts to 75 psi and has no extraction stage at 175 psi. The auxiliary turbine exhausts to 75 psi and is not equipped with an extraction stage.

## Case 41—Alabama Textile Mill

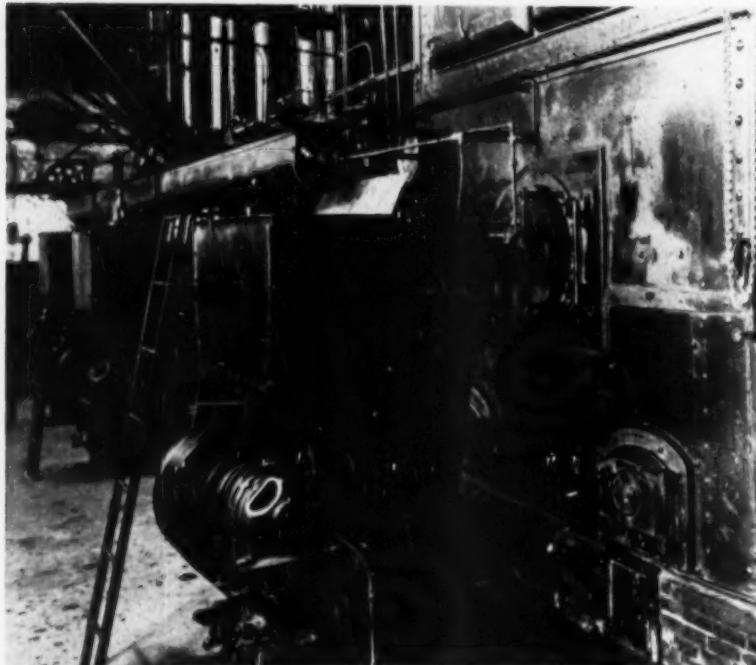
### Gas Burners With Standby Coal

By H. S. Arnold  
F. J. Evans Engineering Company  
Birmingham, Alabama

AFTER over two years of operation of gas combustion equipment, management of a northeastern Alabama textile mill is convinced of the benefits received from using natural gas rather than coal as fuel in their three 300 hp B & W boilers.

With natural gas being burned on an interruptable basis, the cost and inconvenience of handling and storing approximately 6,000 tons of coal per year no longer confronts this mill. Less than 300 tons of coal per year as standby fuel is now required. The change to gas has

Combustion equipment in this Alabama mill consists of Webster Engineering Company type RD-30W burners with Series 14 pneumatic controls, air compressor for supplying compressed air for operating controls and dampers, electronic combustion safeguard, and accessories.



also increased cleanliness, promoted good housekeeping, and lowered maintenance and operating cost.

The combustion equipment consists of Webster Engineering Company type RD-30W burners with Series 14 pneumatic controls, air compressor for supplying compressed air for operating controls and dampers, electronic combustion safeguard, and accessories. One burner is fired through the front wall of each boiler.

Approximately 8" of cinders are placed over the stoker hearth and retort leaving the existing underfeed stoker, hopper and conveyor for standby coal firing. While a minimum of four hours notice is given before an interruption of gas, the boilers may be easily placed on coal firing in approximately two hours. After gas service is resumed, the boilers are again converted to gas-firing in approximately two hours.

#### Control System Operation

A pilot instrument determines the need for a change in firing rate measuring the magnitude of the change required and transmitting the signal that causes the control system to carry the required increase or decrease in the heat input to the boiler. The master pneumatic pilot converts load changes as indicated by minute variations in the steam header pressure into pneumatic impulse of the proper intensity to initiate corrective action by the balance of the control system. The pilot adjusts the signal pressure in exact proportion to the amount of change in steam header pressure and is not subject to this hunting.

One master pneumatic pilot is

NEOPRENE-JACKETED CABLE



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you need stock only one cable type.

\* As one of several types of ANACONDA power cables, DURASHEATH is available in all sizes, single or multi-conductor, copper or aluminum, from 600 to 15,000 volts. It is thoroughly dependable for industrial plants, railroads, series or multiple street lighting, traffic control, and airport† lighting, residential primaries and secondaries, as well as

for such uses as Type USE cable for underground service entrance. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

\*Reg. U. S. Pat. Off. 40312

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*Primary and secondary distribution cables  
• building, machine tool, control and communication wire • portable cords and cables • bus-drop cables • apparatus cables • copper, aluminum, copperweld conductors • wire and cable accessories.*

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connected to the common steam header piloting the operation of all three boilers. A pilot-operated fuel governor is used on each boiler with the connecting fittings required to link the boiler uptake dampers to the governors. This governor controls the fuel supply and at the

same time the air supply by moving the uptake dampers through the action of levers. In this manner both the gas valve and uptake damper movements on all boilers are proportional, and the gas air ratio is constant under the full range of operation.

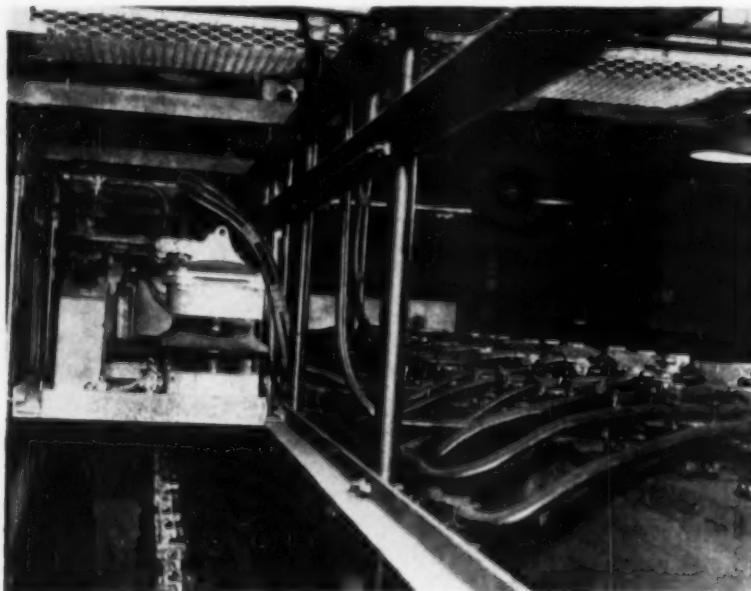
#### Case 42—Maryland

### Station Modernized Without Interruption

EXPANSION and modernization of the municipal electric light plant of the City of Hagerstown, Maryland, was achieved without interruption of service, although the system is operated without any auxiliary source of power. Engineering studies indicated that the new 5,000 kw turbine would overstress the open framework and concrete cell switchgear which had distributed all power at 2400 volts. The decision was made to install new 2.4 kv metalclad switchgear of adequate 250 mva interrupting capacity, and a 13.2 kv system to carry the higher voltage supplied by the new generator.

All of the new metalclad switchgear was installed in the existing

Partial view of main and auxiliary station service breakers. Surge protective equipment for station service bus is at left.



of the new system, much of the old equipment was retained for auxiliary service.

Careful consideration was given to reliability and service dependability of all material used in this installation. Okolite-Okoprene cable, selected for all of the cable requirements, was used on all switchgear, controlboard, generator and exciter equipment, including surge and differential protection devices, as well as bus tie transformer and sub-stations. Design and supervision of construction was carried out by Albert C. Wood Associates, Consulting Engineers, Philadelphia.

#### Case 43—Louisiana

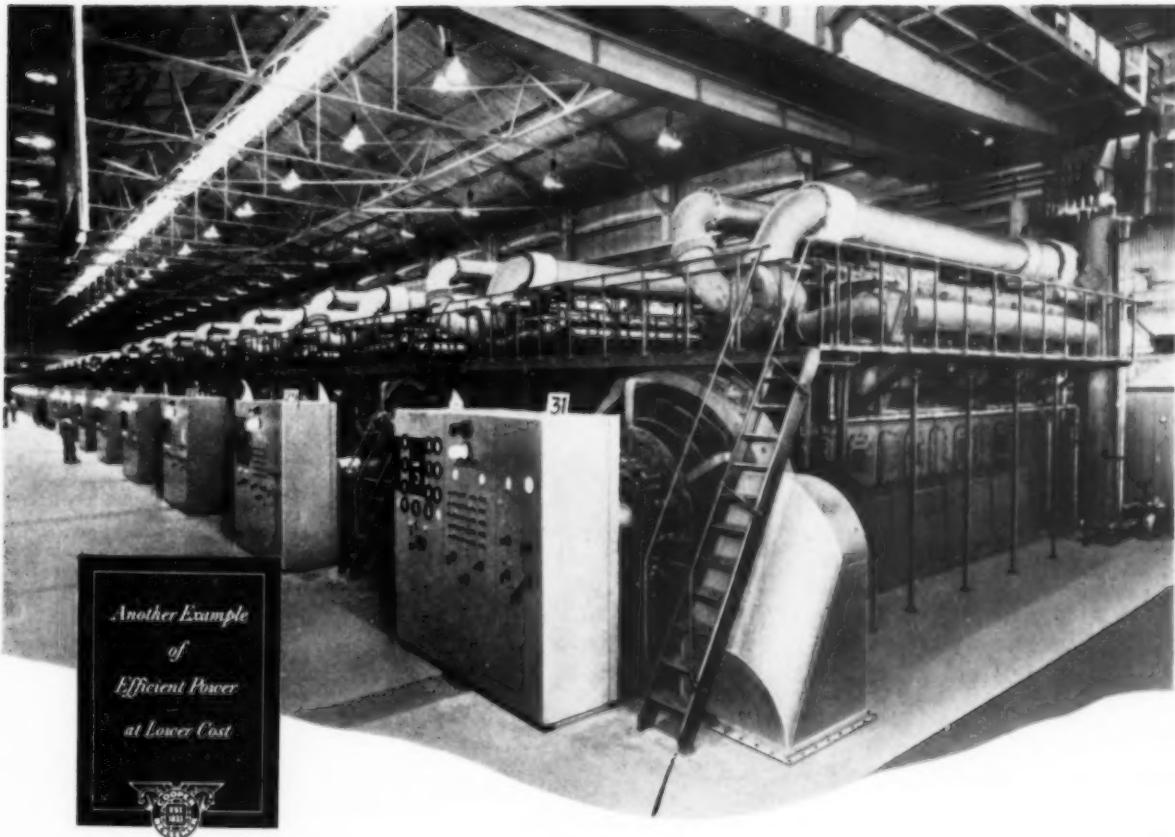
### Clean Air and Less Noise

TWIN problems of excessive noise and clean air for internal combustion engines have been solved by the Trunkline Gas Company, at Loganville, Louisiana, with a unique installation of Burgess-Manning Snubbers.

The company, which pumps natural gas from the rich Louisiana fields to Illinois, installed four exhaust snubbers on the roof of the building housing four 2,000 hp gas booster engines. Four air intake cleaner-snubbers were placed alongside an outer wall of the building. The arrangement insured intake of clean air without excessive noise and quieted the exhaust roar of the big engines.

Intake cleaner-snubbers combine maximum air cleaning with silencing efficiency. The units have two snubbing chambers to smooth the flow of air and another for filtering. Access to the units is through large sash type doors held firmly in place. They are serviced by removing the light weight filter elements and replacing them with clean elements on a service cycle.

The exhaust snubbers are engineered to prevent rather than to muffle noise by means of multiple snubbing stages which convert the pulsing energy of the surging gas into a comparatively smooth stream.



## At Reynolds Metals' San Patricio plant...

*greatest power...  
lowest cost  
with  
COOPER - BESSEMER  
LSV'S*

- In their enormous new San Patricio aluminum reduction plant near Corpus Christi, the Reynolds Metals Company took advantage of the latest, most money-saving developments in engine power.

The above photo shows only half of the 33 Cooper-Bessemer 3,700 hp engines, all under one roof, powering pot line No. 1. It's easily the largest supercharged gas engine generating plant in the world.

What's more, because of their unmatched efficiency, these supercharged engines consume only 10 cubic feet of gas per

kilowatt hour — a key factor in continuous power generation at lower cost than any other facility in the country. To give you a rough idea, these Cooper-Bessemers at Reynolds Metals save enough gas daily to serve a city of 25,000 population.

At the new Reynolds Metals' plant, power for over-all plant operation is likewise produced by Cooper-Bessemers — 9 identical LSV's housed in a separate building. Thus, there are 42 Cooper-Bessemer engines in all, totaling 155,400 horsepower — modern power at its efficient, money-saving best!

New York Washington, D. C. Bradford, Pa. San Francisco Houston,  
Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport  
St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of  
Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

*The*  
**Cooper-Bessemer**  
*Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

## Case 44—N. C. Textile Mill

### **Oil Burner Cuts Operating Costs**

**T**OTAL savings in boiler room operating costs of approximately \$3,800 annually are reported by Quality Mills, Inc., Mount Airy, N. C., as a direct result of installation of a single Iron Fireman Rotary oil burner.

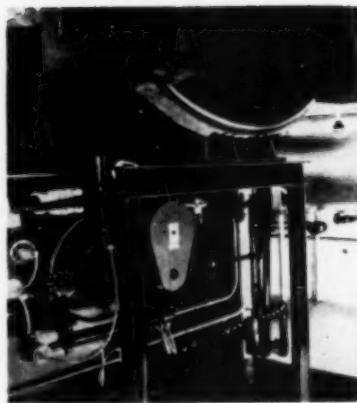
J. Mayberry, vice president of Quality Mills, breaks down the savings in two specific ways: "Our new Iron Fireman Rotary oil burner, installed as directed, has resulted in an \$1,800 per year saving in fuel cost only, over our previous firing method. Besides this, we are saving the cost of a fireman on our first shift, which amounts to about \$2,000 per year."

In addition, Mayberry declares, "the efficiency of the unit has en-

abled us to save a great deal of time on many of our operations calling for quick steam."

Quality Mills, Inc., manufactures underwear. Like other clothing and textile plants, the Mount Airy factory experienced sudden fluctuations in the demand for steam, along with considerable difficulty in meeting that demand. The time saved in producing the extra amounts of steam required for some plant processes in itself has been important, despite the fact that no dollars-and-cents figures can be used to evaluate it accurately.

The Iron Fireman Rotary oil burner installed in the Quality Mills plant is rated at 75 gph. It burns No. 6 oil and is fully automatic in operation. Such oil, of course, costs less than other fuel oils, yet provides up to 12% more Btu's per gallon.



Iron Fireman Rotary oil burner installed in the boiler room of Quality Mills, Inc., Mount Airy, N. C. Engineering feature is the Oil Volumeter, an integral part of the burner. Heavy fuel oils usually present a difficult firing problem because of their changeable viscosity. The Volumeter solves this problem with automatically adjusted pistons which feed a specific volume of oil with each stroke, regardless of the temperature or other physical properties of the fuel.

## Case 45—Missouri Utility

### **Diesel Intercooler Installation**

**T**HREE Nordberg 2-cycle Diesel engines totaling 11,100 hp at the Carthage Water and Electric Plant, Carthage, Mo., are equipped with Young Intercoolers.

The three Nordberg engines used are designed for operation on dual-fuel, burning primarily natural gas with a small quantity of diesel pilot fuel. Dual-fuel en-

gine operation, however, is handicapped during hot summer weather by the fact that the fuel detonates before peak engine ratings are reached. The net result of the premature detonation is only partial engine loading, loss of generating capacity, overheating and engine knocking.

The problem of detonation can

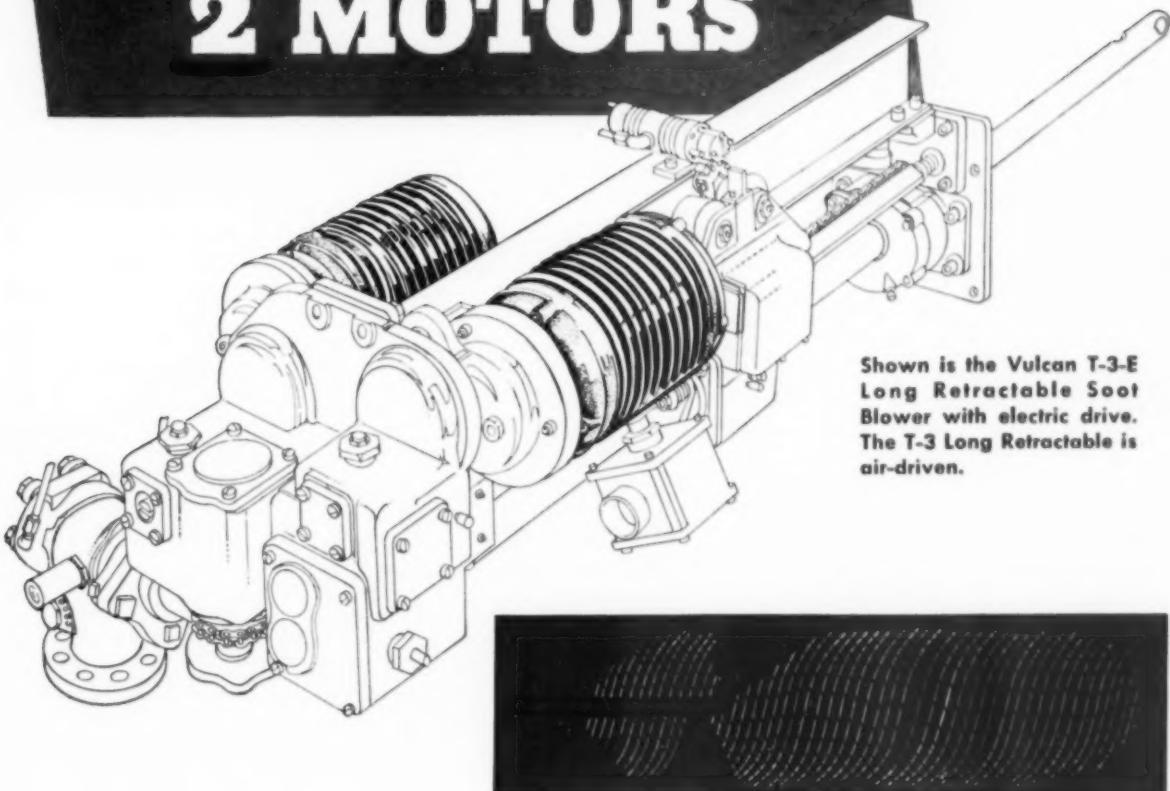
be remedied by using the dual-fuel engine as a straight diesel by burning only diesel pilot fuel or by the use of scavenging air intercooling. Diesel fuel costs much more than natural gas for each kw of power developed so in the interests of fuel economy it is advisable to use air intercooling to prevent detonation.

The Nordberg engines are equipped with Young Intercoolers mounted between the motor driven scavenging air blowers and the air intake manifolds. Air enters the Intercooler at a temperature of approximately 130 F and is cooled to a temperature of approximately 100 F, using city water as the cooling medium. As a consequence, the cooled air entering the cylinders permits a greater quantity of fuel to burn without detonations, thus increasing engine horsepower and generating capacity to 100% and more of the given rating.



Insulating case housing a Young Single-Pass Intercooler. Case floats the intercoolers and reduces vibrations and noise. Intercooler cores are made up of  $\frac{1}{8}$  in. copper tubes and aluminum fins, mechanically bonded for maximum strength and heat transfer. For greatest heat dissipation efficiency, the fins are dimpled to provide maximum air turbulence and thereby overcome laminar flow.

# VULCAN 2 MOTORS



Shown is the Vulcan T-3-E Long Retractable Soot Blower with electric drive. The T-3 Long Retractable is air-driven.



THIS CLEANING PATTERN—an infinite number of double-helix paths—makes the second motor of a Vulcan Long Retractable Soot Blower a most profitable investment. Two motors cost more—but they are worth more.

To get such thorough cleaning—with the blowing steam or air always cleaning a new path—you must have two motors. One motor moves the lance in and out—the other rotates it. And with the two motors, traversing and rotating speeds are independently adjustable for your exact needs.

This double-helix pattern cuts tube replacement

costs. There is no danger of the blowing medium constantly striking—and wearing away—the same part of each tube. Packing life is increased.

These are reasons why Vulcan "Long Retracts" are found on so many new high-duty boilers. Users know Vulcans pay for themselves quickly and often. The story is told in Bulletin 1002. Write for it.

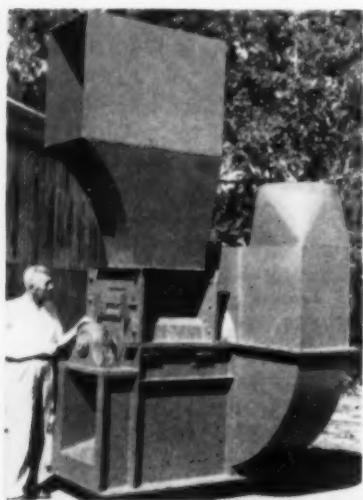
**COPES-VULCAN DIVISION**  
**CONTINENTAL FOUNDRY & MACHINE COMPANY**  
**ERIE 4, PENNSYLVANIA**

**VULCAN**  **Automatic Soot BLOWERS**

## Case 46—Florida

### More Efficiency From Wood Waste Fuel

**D**ISPOSAL of wood waste (slabs, chips, bark, etc.) has been converted from a problem into an asset in many Southern industrial operations through use of the Bio-Hog.



This Montgomery Bio-Hog, shown with its inventor, W. T. S. Montgomery, president and chief engineer of the Jacksonville Blow Pipe Company, Jacksonville, Florida, will eat up almost anything up to 12 in. in diameter and is capable of handling ten tons of scrap an hour, Montgomery says.

W. T. S. Montgomery, President of Jacksonville (Fla.) Blow Pipe Company was already thoroughly familiar with wood waste handling, because developing and marketing his widely used blow pipe systems provided intimate contact with wood working industries throughout the South. So his decision to provide a machine for processing this waste into better fuel was a natural result of his desire to serve his customers.

In the early 1940's, on a swing into Southern Florida to do some trouble shooting in a blowpipe installation at a veneer mill, Montgomery observed many tons of waste wood and bark piled untidily behind the mill.

"Why don't you get rid of that stuff?" Montgomery asked the mill owner. "It's a fire hazard, it looks like the dickens, and it takes up a lot of valuable space."

"We would like to grind it up for fuel," the mill owner said, "but there's no machine on the market that can handle the stuff." Today there is—but it took more than five years of concentrated effort and much burning of midnight oil before

Montgomery was satisfied with his Bio-Hog.

This year, the engineer-inventor is satisfied that the Bio-Hog is virtually perfected. It eats up everything—pine, oak, gum, hickory,

(Continued on page 136)

## Case 47—Texas Chemical Plant

### Water & Sludge Removed from Turbine Oil

A TEXAS chemical plant has increased the efficiency of a turbine generator by installing a Liquid Separator-Filter unit manufactured by the newest division of the Fram Corporation.

The Liquid Separator Division of Fram, with new headquarters in Richmond, Virginia, reports that the chemical plant was having difficulties in turbine operation caused by water and sludge in the turbine oil.

The sludge and water in the oil had caused corrosive action on closely-machined turbine parts, necessitating frequent costly repairs and down-time of the turbine equipment.

The turbine used SAE 20 rust oxidation inhibitor oil. Prior to installation of a Fram Liquid Separator-Filter the oil contained an

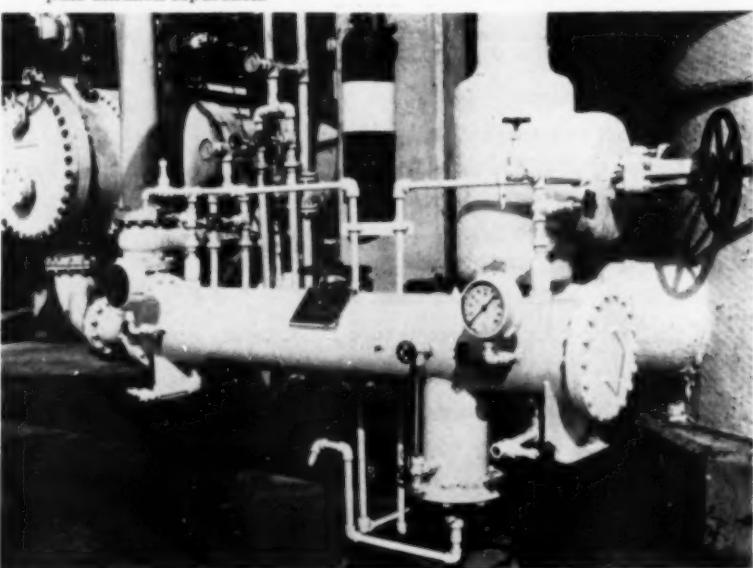
average of 7 to 10% water and sludge by periodic sampling.

With the Fram Liquid Separator-Filter installed, turbine operators reported that after 45 minutes of operation, virtually all water and sludge had been removed from the oil. Samplings at the tank outlet showed a complete absence of water, with the sludge also removed from the oil, demonstrating complete one-pass filtration-separation.

Oil samples were also taken weekly for a 4 month period. At the end of each week, the chemical plant engineers found no trace of water or sludge in the turbine oil. The viscosity and neutralization number was unchanged.

The original oil in the turbine had not been changed during the 4 month period, and original cartridges were still being used.

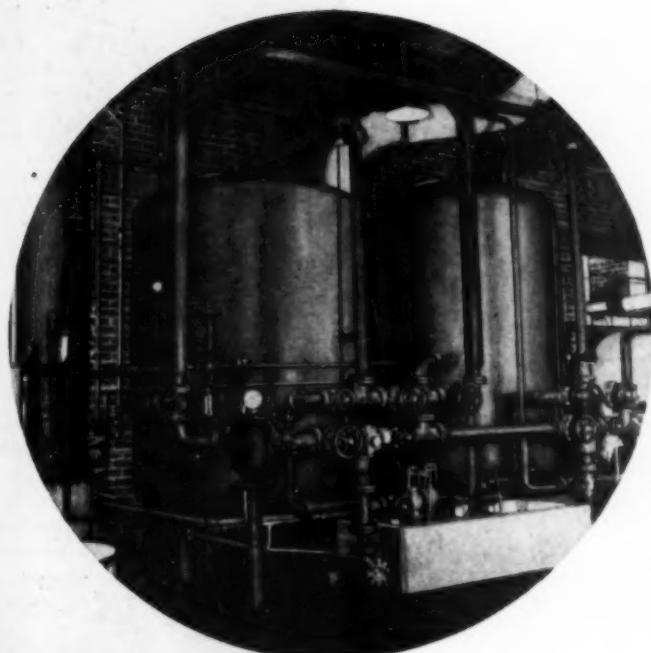
Fram Liquid Separator-Filter installation in this plant demonstrated one-pass filtration-separation.



# *How this Demineralizer*

*delivered a*

# BONUS



**GRAVER EQUIPMENT IN THIS PLANT**

Two-bed demineralizer to treat 300 gpm of boiler feed make-up. Total capacity of softening plant per regeneration: 640,000 gallons, using Gravex ion exchange material.

J. E. Sirrine Co., Consulting Engineers, selected Graver demineralizing equipment.

## **GRAVER WATER CONDITIONING CO.**

*Division of Graver Tank & Mfg. Co., Inc.*

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In Canada: The Bird Archer Co., Ltd., Cobourg, Ontario

In Mexico: Proveedores Técnicos, S.A.; Puebla 259, Mexico 7, D. F.

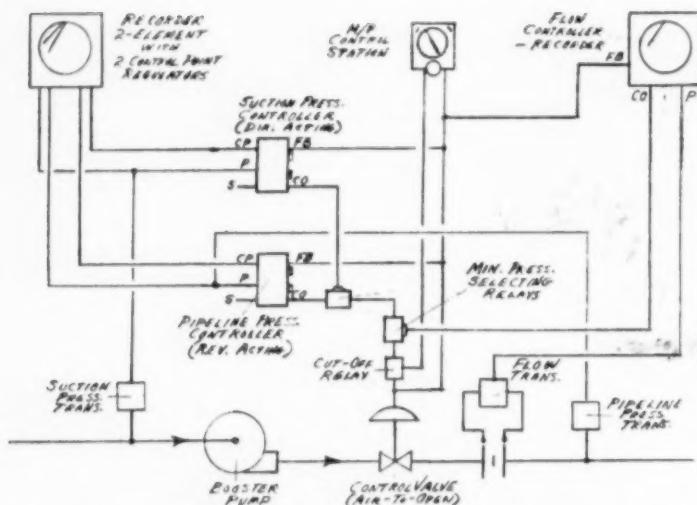
**GRAVER**  
*Demineralizers*

GW 469

# Controls and Distribution

## Section 6

*Discharge control valve performs three distinct functions simultaneously . . . drying control air to a low dew point . . . modern pumping equipment coupled with automatic controls . . . plant control center*



Automatic override control designed by Moore Products Co. for a crude oil pipeline booster pump control station.

### Case 48—Texas Pipe Line

#### Automatic Override Control on Booster Pump Control Stations

A UNIT control system cannot always be as simple as the basic control loop consisting of the process, process variable measuring transmitter, controller, and final control element. Applications arise, where for purposes of operating safety and economy, it is

necessary to integrate several control loops with a single control element in such a manner that the single element is made to control a number of independent variables.

Such a system is used with booster pump control stations on

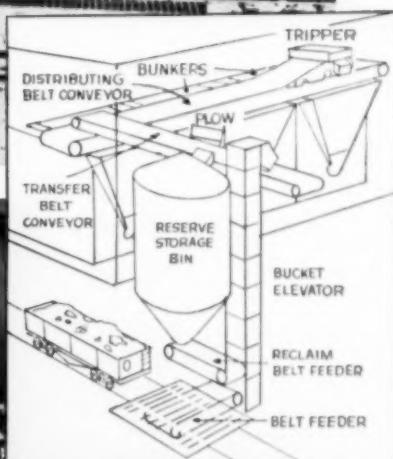
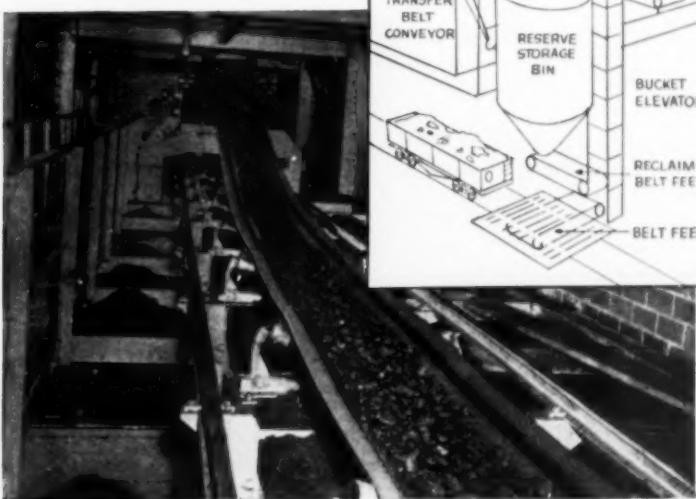
oil pipe lines where the discharge control valve is required to perform three distinct functions simultaneously. The valve serves normally as a flow control valve but, in addition, its prime function is to maintain the pump suction pressure and pipe line pressure from exceeding certain prescribed values as determined by requirements for safe operation.

The system diagramed was installed by a large Southwestern pipe line corporation on a crude oil booster pump station. It combines all the operations which might otherwise require the use of three complete and independent control systems while, at the same time, it effects a saving in that two expensive control valves are eliminated.

#### How System Operates

On this control station, appropriately ranged transmitters measure suction pressure, pipe line pressure and flow. Each of these transmitters works in conjunction with its own reset and throttling type controller on which the respective control points are pneumatically set. The controller actions on the respective controllers are set to give a decreasing out-

# Maximum power plant efficiency starts with low-cost coal handling



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As boilers and generating equipment approach their efficiency limits, the one large-scale method to reduce cost per kwh is improved coal handling. That's why Link-Belt's broad engineering experience and complete line of equipment are so important.

Whether your requirements are large or small, Link-Belt will design and build a coal handling system to give you the highest efficiency and greatest economy. Our engineers can choose from all types and sizes of equipment for unloading, storing, handling and weighing your coal. And Link-Belt will assume complete responsibility for the entire installation — from planning to erection.

You can see the latest in equipment and system layouts in Link-Belt Book 2410. Ask the engineer in the Link-Belt office near you for a copy. He'll also be glad to show you how this modern planning can cut costs on your particular handling problem.

At A. V. Roe Canada Limited, Malton, Ont., one of Canada's biggest industrial plants, coal moves from track hopper on belt feeder to bucket elevator to transfer belt conveyor. Manually operated plow diverts coal from transfer belt conveyor to reserve storage or allows it to be carried to distributing belt conveyor where tripper discharges it to various bunkers. A second belt feeder reclaims coal from reserve storage bin to bucket elevator.

13,000

**LINK-BELT**

**COAL HANDLING EQUIPMENT**

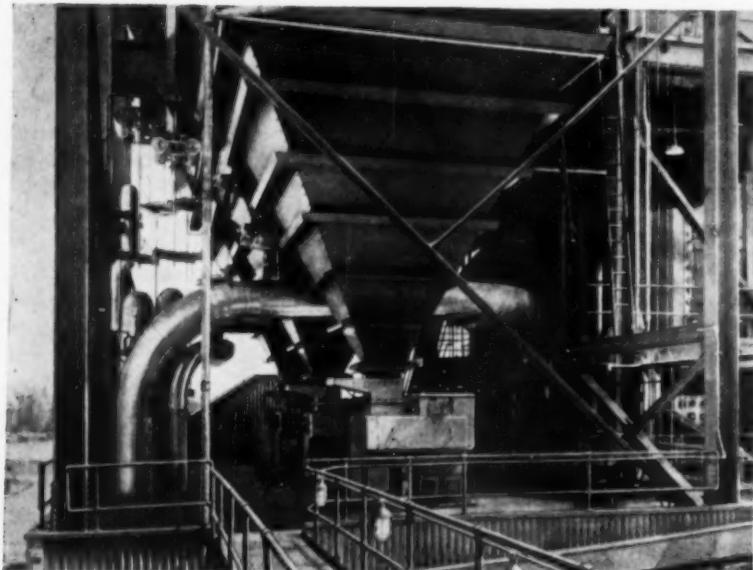
**LINK-BELT COMPANY:** Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

# Carolina Power & Light

*again specifies*

## Richardson

Richardson Automatic Coal Scales are playing a vital part in helping supply power for the new Industrial South. Here are Richardson Model 39's in an outdoor installation at the new generating station of Carolina Power and Light.



To both industrial and utility power generating stations, specifying Richardson means—

- ① A 24" x 24" inlet opening and 26" wide belt for maximum coal flowability.
- ② All wiring and controls outside coal chamber.
- ③ Access doors which will not spill dust on floor when opened.
- ④ Beam ratio test facilities outside coal chamber.
- ⑤ Gravity operated by-pass, with no restriction of coal flow to downspout.
- ⑥ No drag links or wires attached to weigh hopper.
- ⑦ Nationwide after-delivery service.

Latest development in the 39 Series of Richardson Automatic Coal Scales is the Model H-39 shown below. May we send you our new 16-page engineering data book on the H-39 Coal Scale (Bulletin 0352), without cost or obligation?

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## Richardson—

MATERIALS HANDLING BY WEIGHT SINCE 1902

put pressure with increasing flow, increasing pipe line pressure and decreasing suction pressure. The heart of the system is the series arrangement of two minimum pressure selecting relays which function to transmit to the air-to-open control valve only the minimum of the three controller output signals. Smooth transition of control is made possible through the use of a common feedback on the three controllers. The feedback pressure is at all times the output of the commanding controller.

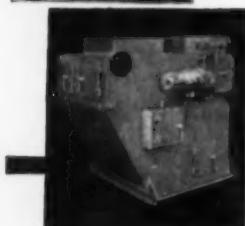
With this arrangement, the flow controller retains command of the control valve as long as the suction pressure remains above its control point and the pipe line pressure remains below its control point because, under these conditions, the output from the flow controller will be the minimum of the three controller output pressures. If, for instance, the pipe line pressure rises above its control point, the pipe line pressure controller output drops below the value of output of the other two controllers and the valve is then under control of the pipe line pressure controller. The same transition results if the suction pressure drops below its control point.

The single Moore M/P Control Station and the cut-off relay serve to provide a means of bumpless transfer between automatic and manual control on the valve.

### Case 49—Louisiana

#### Moisture Problem

A LOUISIANA paper mill experienced control difficulties in air operated instruments due to condensing moisture. Installation of a J. F. Pritchard & Company instrument air HYDRYER eliminated the problem by drying the control air to a low dew point. Additional results: Increased quality of product; increased plant production and lengthened equipment life; decreased corrosion in instruments; reduced losses in man hour production time, maintenance costs and repair costs.

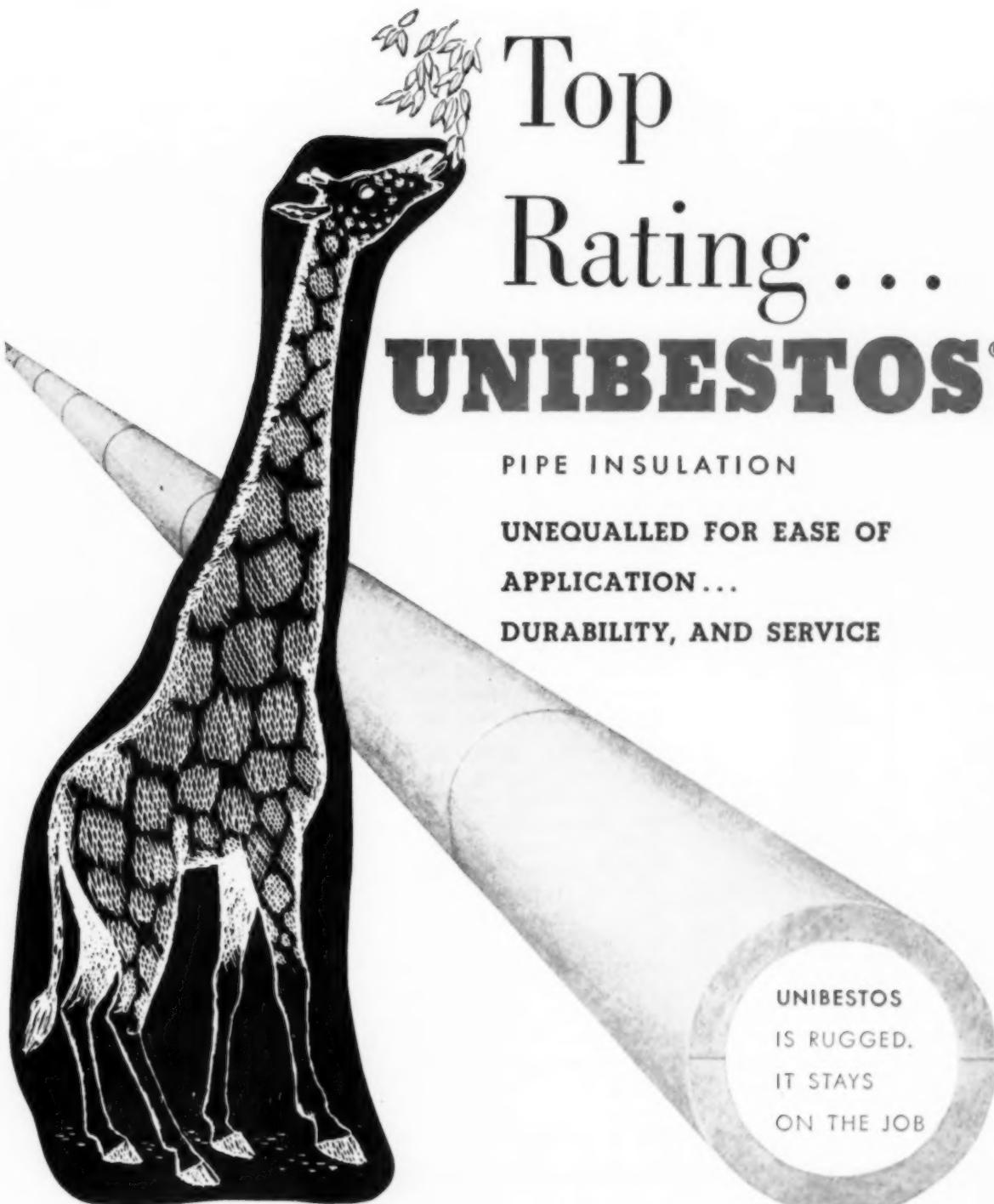


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IS RUGGED.  
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SOUTHERN POWER & INDUSTRY for OCTOBER, 1953

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Turn to the expert engineers and inspectors of Custodis. Throughout the United States and Canada they are constantly solving chimney problems. The list of satisfied customers of Custodis, built over fifty-one years of service, includes most of the progressive industrial organizations on this continent.

Any job, large or small, receives our careful attention and the benefits of our long experience, sound engineering, expert supervision and skilful workmanship.

## CUSTODIS CONSTRUCTION COMPANY, INC.

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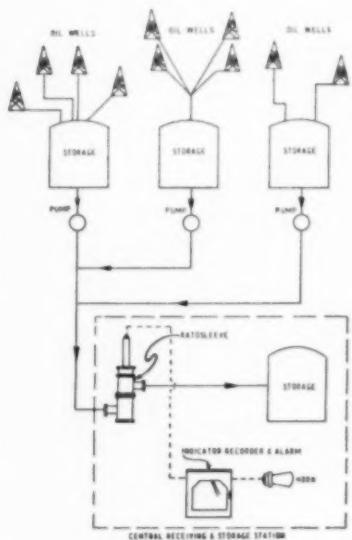
NEW YORK  
25 Broadway  
DI 4-1924

CHICAGO  
22 West Monroe St.  
RA 6-3614

## Case 50—Kentucky

### Pipe Line Leak Sounds Alarm

AN Eastern Kentucky pipe line system has completed a program for providing completely modern pumping equipment coupled with automatic controls. Of special interest is the emergency flow control system, which automatically detects leaks in pipe lines and initiates corrective action.



Schematic diagram showing relative position of wells, transmitting meters, and alarm controllers.

Utilizing a float with a high immunity to viscosity variations, each meter was installed with a sealed float extension armature moving through electrical transmitting coils. Change in float position is sensed as a change in coil inductance which in turn causes a change in position of a similar armature coil arrangement in the receiving instrument. Each receiving instrument, mounted on the control board of the operating office, consists of an F&P indicator-recorder with special adjustable alarm switch and fixed alarm switch.

In operation, the adjustable alarm switch is set at a point slightly lower than the volume of oil being received at the station. Thus, whenever a leak occurs, the recorder falls below the set point. If the recorder remains below the set point continuously during five minutes, a relay is closed sounding an alarm. The purpose of the fixed alarm switch which is set at zero flow is to prevent the alarm from sounding during shutdown periods.

The most important factors in curtailing the loss of oil through pipe line leaks are Fischer & Porter Ratosleeve flow meters installed at

# WALWORTH Pressure-Seal VALVES

For high-pressure, high-temperature services



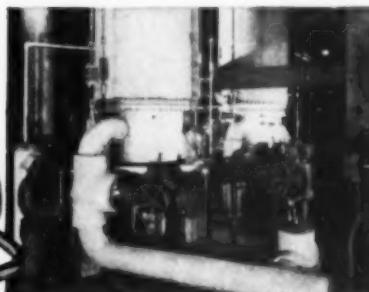
Walworth 6-inch Series 900 Pressure-Seal Gate Valve with Series 1500 Y-type Globe Valve on the by-pass.



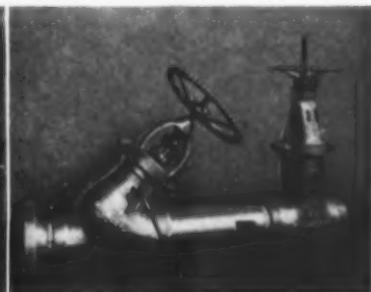
CHEMICAL PLANT: Walworth Pressure-Seal Valves in the pressure reducing station of a chemical plant.



MARINE: Walworth Pressure-Seal Valves aboard the S.S. "Wilfred Sykes"—largest Great Lakes ore carrier.



LIGHT AND POWER: Walworth Pressure-Seal Valves equipped with motor operators, in an eastern public utility plant.



PAPER MILL: Fabricated header with 8-inch Series 600 Pressure-Seal Y-Globe Non-Return Valve and Series 600 Pressure-Seal Gate Valve.

The bonnet and body design of Walworth Pressure-Seal Valves is such that the pressure within the valve is used to prevent leakage at the junction of the bonnet and body. The bonnet joint of the Walworth Pressure-Seal Valve is permanently tight because there is no dependency on the ability of any component part of the joint to resist creep during long exposure to high temperature. Sudden temperature and pressure changes do not affect this tightness. Bonnet flanges and studs are eliminated and the weight of the valve is reduced.

An improved flexible disc design maintains seat tightness, even when the valve body is distorted by pipeline stresses or by temperature and pressure changes. This improved disc design makes it easier to open and close this valve.

Walworth Pressure-Seal Valves are easy to disassemble and assemble, and are the most satisfactory valves for high-pressure, high-temperature service. They are available in Series 600, 900, 1500, 2500 and in a wide range of sizes and types. For further information, write for Circular 116.



Series 1500 Cast Steel Y-type Globe and Angle Valves in sizes  $\frac{1}{4}$  to 2 inches.

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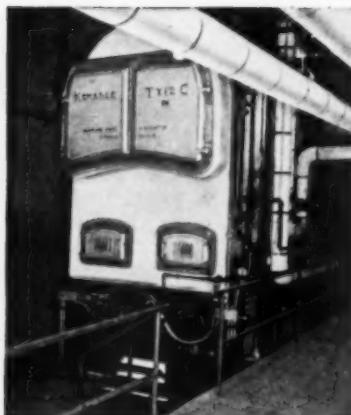
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MORE EXPERIENCE

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One of a Battery of Type "C" Kewanees in  
The Hecht Company Store, Arlington, Va.

# KEWANEE

## **STEEL BOILERS**

- 84 years experience in designing and building steel boilers provides an accumulated knowledge sure to result in boilers of unusual economy and dependability.
- *More material and labor* also play their part in making Kewanee Boilers different and better. "Skimp" on steel and the boiler can't be big enough to do its job . . . use lighter weight plate and strength and durability are reduced. More goes into Kewanee Boilers, so the owners get more from them. That's why they are universal favorites for generating dependable, economical heat or power.
- In designing and equipping their "Parkington" store, The Hecht Company applied its vast retailing experience to provide the utmost in shopping convenience and comfort. Modern features include 127 complete departments; air conditioning; high speed elevators and motor stairs; fluorescent lighting; acoustical ceilings . . . and for the important job of heating . . . Kewanee Boilers.

## KEWANEE-ROSS CORPORATION

Division of American Redicator & Standard Senator, Corporation

## **KEWANEE, ILLINOIS**



*Serving home and industry*

all receiving stations and operating in conjunction with remote F&P recording-controllers on the control board of each station. Each controller is set for the normal rate of incoming oil flow; whenever the flow rate drops below that point for as much as five minutes, implying a line leak, a relay is actuated which sounds an alarm at the pumping station and also at the home of the engineer. The five minute time-delay is set as the period during which the oil flow rate must be below normal so that transient fluctuations in flow rate will not affect the alarm.

Whenever the alarm is heard during the daytime, the engineer calls the appropriate upstream station by radio and has the flow stopped until the leak is found and corrected. At night, when there may be no operator on duty, a five minute drop in the flow rate automatically stops the upstream pumping station by means of a radio relay. When this happens, the alarm in the engineer's home also sounds.

### Case 51—Tennessee

## **Modern Controls in Phosphate Production**

**T**HE Shea Chemical Corporation near Columbia, Tennessee, is in the center of large phosphate deposits, which are located just under the surface and shallow enough to be strip mined. Deposits are in two forms, a phosphate rock and a matrix.

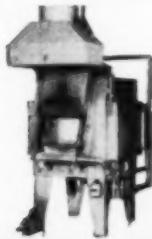
The matrix looks very much like plain garden dirt, but is high in phosphate content. The material is strip mined and hauled by truck to the Shea Chemical Corporation where it is stored in the open in large piles. The material is then loaded into a hopper from which it is fed into a pre-drying kiln. The material falls from the pre-drying kiln onto an inclined conveyor and is fed into another rotary kiln called the nodulizing kiln. The high heat in the nodulizing kiln causes the material to form into small lumps or nodules.

These nodules are mixed with

**Conveyor  
brazing  
furnace**



**Batch  
tempering  
furnace**



**Controlled  
atmosphere  
hardening  
furnace  
(tool room)**



**Controlled  
atmosphere  
conveyor  
furnace  
(production)**

**a complete line of  
heating and melting  
FURNACES**

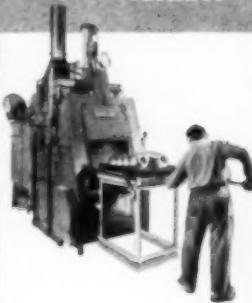


**Lindberg-Fisher  
2-chamber  
induction  
melting  
and holding  
furnace**

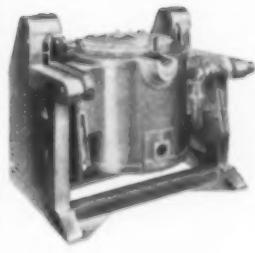


**High frequency  
induction  
heating unit**

**Carbonitriding  
furnace**



**Fisher  
melting  
and holding  
furnace  
(gas or oil  
fired)**



Lindberg Engineering Company manufactures a complete line of industrial heat treating furnaces, industrial melting furnaces, and high frequency induction heating equipment.

*For additional information contact your nearest Lindberg office in the South*

**ATLANTA, GEORGIA:** P. J. Duffy, 1170 Pine Ridge Road, N.E.,  
Telephone . . Cherokee 8014

**HOUSTON, TEXAS:** William A. Hammer, 1406 Jefferson Ave.,  
Telephone . . Blackstone 6287

**LINDBERG FURNACES**

**LINDBERG ENGINEERING COMPANY**

2486 WEST HUBBARD STREET, CHICAGO 12, ILLINOIS

coke and silica rock and charged in a continuous process into an electric furnace. Phosphorous gas is given off in the furnace and is picked up by the Nash Compressors. Small dust particles picked up with the gas are eliminated in a precipitator.

The phosphorous gas is condensed to form phosphorous. This phosphorous is then burned and these gases are condensed to make phosphoric acid. Phosphoric acid and

lime are combined to make di-calcium phosphate which is used as an animal feed supplement.

The animal feed supplement is shipped in bulk and also in 100 lb bags to various animal feed processors.

This acid plant control center is one of several Clark Controller Co. installations at the Shea Chemical Corporation near Columbia, Tennessee. Unit houses controls for 60 hp Nash compressors, cooling tower fans, cooling tower pumps, recirculating pumps and other auxiliaries.



## Wood Waste Fuel

(Starts on page 126)

elm, wet veneer, sandy bark, cores, timbers and slabs. It will even eat up wire, nails, screws, or steel plate  $\frac{1}{8}$  in. thick, without any damage to the machine. It has opened up a tremendous new field for a great many wood-working plants. Now they can convert nuisance scrap into profitable items, and one of its big economical advantages is that when fed by conveyor, it does not require an attendant. Cutting surfaces of the teeth and anvils are coated with Tungsten Carbide, almost as hard as diamond.

Recently the Blo-Hog has crashed the paper industry by solving one of their most difficult problems—the grinding of bark from their tumbling drums. When handling pine only, this was not too difficult but when they started using hardwoods, particularly gum, this bark played havoc with their live-bottom bins and no other hog could grind gum bark.

Having ironed out the bugs and solved the problems of an "all-purpose hog"—Bill Montgomery is now burning midnight oil in the development of a new type combination dust collector and incinerator which he says will "burn completely, have no sparks, no spark arrestor, no smoke, centrifugal action, and suspension burning."



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# HERE'S SIMPLE ARITHMETIC on PREFABS:



## PREFAB BUILDING + TRAMRAIL CRANE =

- 1 Low Cost**
- 2 Good Construction**
- 3 Efficient  
Overhead  
Materials  
Handling**



Butler Prefabricated Buildings are especially well suited for overhead cranes. Their cross-section makes it possible for a crane to span the entire width and provide service for all of the floor area. Their sturdy construction enables them to support heavy loads. The Cleveland Tramrail crane here is hand-propelled with chain hoist. It has 4000 lbs. capacity. The building is 40' x 100'.

**D**o you need a building for warehousing or manufacturing? One at low cost? Of good durable construction? Equipped with overhead materials handling facility? Then look into prefabricated metal buildings provided with a Cleveland Tramrail Crane. This combination has proven to be economical and efficient for a number of companies.

Prefabs will usually support crane loads from 1000 to 6000 lbs. depending upon type and size building. They can be made any length and by joining units can be made of various widths.

Hand-propelled cranes with electric hoists are generally most practical in prefabs. Because Cleveland Tramrail cranes and carriers roll so easily, very little effort is required to propel them manually. While chain hoists are satisfactory, but slow, most users find electric hoists desirable to do the heavy lifting.



Cleveland Tramrail cranes have proven satisfactory in quonset buildings. This 40' x 100' building, erected in 1947, has a crane runway 19' above the floor. The 24 ft. span crane is hand-propelled with electric hoist. Capacity is 2000 lbs.

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**CLEVELAND TRAMRAIL DIVISION**  
THE CLEVELAND CRANE & ENGINEERING CO.  
7471 East 284th  
Wickliffe, Ohio.

**CLEVELAND TRAMRAIL**  
OVERHEAD MATERIALS HANDLING EQUIPMENT

## Equipment . . Supplies . . Methods

### new equipment (continued)

For more data circle item code number  
on the postage free post card—p. 17

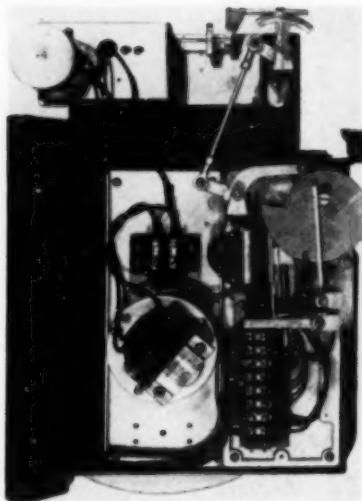
(Starts on page 9)

RC 31 hardness and  $\frac{3}{4}$  in. threaded bolts in about a half minute. This compares to at least 10 min. for sawing in a vise, cold chiseling or acetylene cutting.

### Electronic Flowmeter

J-4 THE HAYS CORPORATION, Michigan City, Indiana, has developed a new flow meter of the electronic type which makes use of mercury-less bellows type transmitters.

Meter is available in several different models for indicating, recording and with a continuous type me-

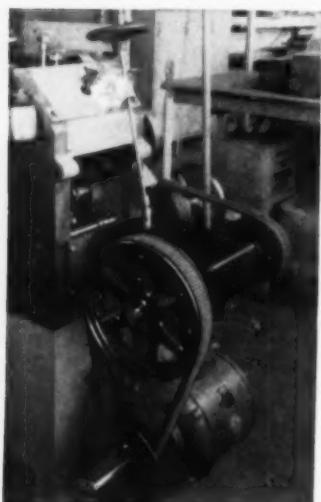
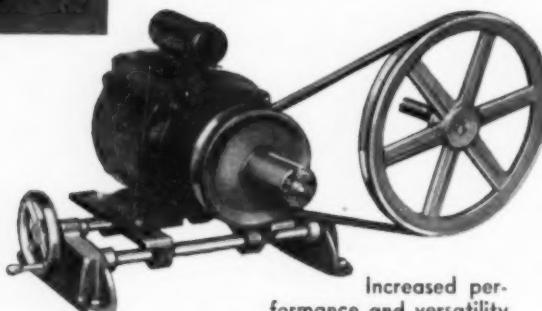


Hays Corporation's electronic mercury-less flow meter.

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machine  
performance...

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for new or old machines can be obtained at low cost with LOVEJOY VARIABLE SPEED PULLEYS. A mere turn of the hand is all that is required to speed up or slow down the driven unit. Installation is as easy as an ordinary V-Belt drive. Speed adjustment is both accurate and infinitely variable over a wide range. Changes in production schedules, adjustment for operator ability, and corrections for size or stock . . . temperature or humidity . . . size or density of materials are instantly and easily accomplished. Available in 8 sizes, from fractional to 8 hp. Ratios to 3 to 1.

chanical integrator or combinations thereof for measurement of the flow of fluids such as steam, water and other fluids and gases. Records of air flow for boiler operation and pressures and temperatures can be combined in the same meter.

The differential pressure transmitters used with the meter are of the metallic bellows, rupture proof type for differentials of from 20" water to 750" water with a standard static operating pressure of 1500 psig. Higher pressure ratings can be supplied if required. The meter is also available for the measurement of liquid level in an enclosed vessel such as a boiler drum. The transmitter for this application differs from the others in that it is of the buoyant float operated type with torque tube assembly. The transmission system employed between the transmitter and recorder makes use of differential transformers and a null balance a-c system independent of line voltage variations.

### Negative Pressure Pneumatic Conveyor

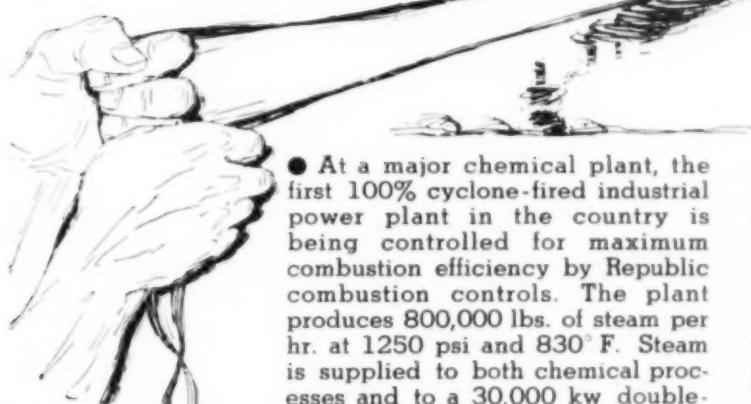
J-5 SPROUT, WALDRON & Co., INC., Muncey, Pa., has announced an improved pneumatic conveying unit for handling bulk materials.

Called the Pneu-Vac, it is a negative pressure, or draw-through system, in which the fan is located on the opposite side of the collector from the material conveying line.

A fan mounted directly on the top of a long-cone collector and a rotary vane feeder valve at the base of the collector are combined into a compact

**They're  
Harnessing  
Cyclones....**

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*Automatic*  
**COMBUSTION  
CONTROL**



● At a major chemical plant, the first 100% cyclone-fired industrial power plant in the country is being controlled for maximum combustion efficiency by Republic combustion controls. The plant produces 800,000 lbs. of steam per hr. at 1250 psi and 830° F. Steam is supplied to both chemical processes and to a 30,000 kw double-extraction turbine generator.

This cyclone-fired plant serves as additional proof that Republic combustion control systems can be adapted for any type of fuel firing

There are Republic combustion control systems for all sizes and types of boilers, all arrangements of draft equipment and for all load conditions. There's an experienced engineering staff\* to help you get the combustion control system that best fits your needs.

For full information, write for Data Book S-21 or contact your nearby Republic field engineer.

*\*For more than 37 years, Republic has specialized in the design and manufacture of combustion control systems for all sizes of power generating stations.*

**FOUR CYCLONES AT  
HIS FINGER-TIPS . . .**

Two 400,000 lbs./hr. boilers fired by four cyclone furnaces are checked and controlled from this central control point. Republic sub-panels on the control bench board are provided for transferring between automatic and manual operation. Also included are Republic biasing sub-panels for adjusting coal-air ratio, primary-secondary air, cyclone ratio and boiler rating.



**REPUBLIC FLOW METERS CO. • 2240 DIVERSEY PARKWAY • CHICAGO 47, ILLINOIS**

## **new equipment (continued)**

For more data circle Item code number  
on the postage free post card—p. 17

unit. Every Pneu-Vac is individually engineered to suit the application and installation. The manufacturer also supplies the proper piping and other auxiliary equipment.

The system is extremely flexible since physical obstacles to conveying are non-existent beyond the space required for the pipe of proper diameter. The material being conveyed does

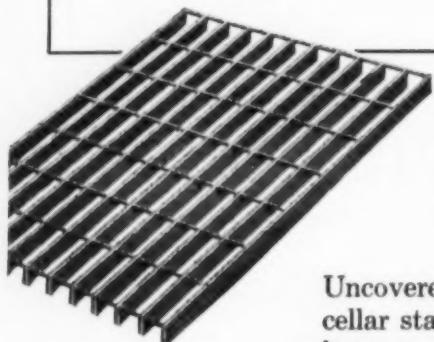
not pass through the fan, so the system is free of mechanical friction, thereby minimizing wear. There are no buckets to replace, no belts to renew, no screws to repair.

Since the product conveying lines are under negative pressure and are sealed to maintain a positive air balance, exterior dusting and corresponding loss of product is eliminated. Because the material is suspended in a high velocity air stream, it is completely aerated, thus suitably conditioning it for additional cooling, drying or heating if required.



Sprout, Waldron & Company's Pneu-Vac is built in twelve standard sizes with fan motors from 2 to 60 hp. Units are handling many varied granular products with capacities of up to 50 tons an hour and more in multiple systems, and with runs of 300 ft of pipe and over.

### **Make those OPEN SPACES SAFE and USABLE with this unique, one-piece OPEN STEEL FLOORING**



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SECURE!**

Uncovered pits, light wells, cellar stairways, etc., quickly become safe and usable areas when floored with Blaw-Knox Electroforged Steel Grating. Made in one piece . . . no nuts or bolts to rattle or lose. Provides safe footing even when wet or greasy and lasts indefinitely. Admits maximum light and air. Furnished in any shape, cut to fit. Just send dimensional sketch of area to be covered and we will forward price by return mail.

**BLAW-KNOX COMPANY**  
*Grating Department*

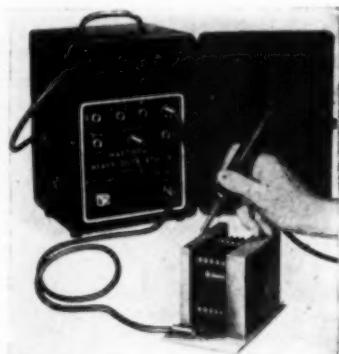
**BLAW-KNOX EQUIPMENT DIVISION**  
2034 Farmers Bank Building, Pittsburgh 22, Pa.  
Sterling 1-2700

ELECTROFORGED® STEEL

# **BLAW-KNOX GRATING**

### **Heavy Duty Etcher**

**J-6** THE MARTINDALE ELECTRIC COMPANY, 1334 Hird Ave., Cleveland 7, Ohio, has introduced a newly designed electric etcher which has found acceptance as a production line etching tool and also in tool rooms where heavy parts are marked.



Its wide range of heats makes it suitable for use on small parts or (on one of the two highest heats) for marking large pieces such as crowbars, shovels, and castings.

Six heats give 180, 310, 425, 550, 800, and 1375 watts respectively. As these are all taken from taps on the secondary, the full primary winding is always in the circuit and therefore this etcher may be left connected to the line without danger of overheating when not in use.



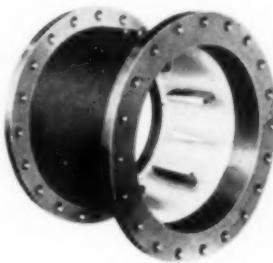
# FOSTER VALVES AND FLOW TUBES

## for MEASUREMENT • REGULATION or CONTROL

## for Accuracy • Dependability • Low-Maintenance

### FLOW TUBE

The Flow Tube is a relatively new primary element for the extremely accurate measurement of flow. It consists, essentially, of a short spool piece, the inner periphery of which is equipped with two groups of pressure nozzles, one group pointing upstream and the other downstream. The nozzle groups are inter-connected by common pressure rings from which connections are made to the high and low pressure sides respectively, of a conventional indicating, recording or integrating meter. Flow Tubes differ from other variable head meters in that the taps are located at points of equal cross-sectional area. Therefore, the differential developed is a function of the velocity head and independent of the static head.



Flow Tubes are compact, comparatively light weight, relatively low in cost, and are easy to install since they require straight runs entering and following only when installed near valves or regulators. And, Flow Tubes are available in types and D/d ratios to provide differentials that can be accurately measured with the least head loss.

Flow Tubes are furnished with head capacity curves based on laboratory tests. This data furnished with each Flow Tube makes our guarantee of exceptional metering accuracy possible.

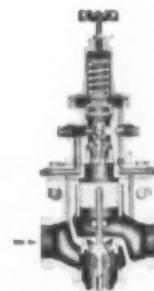
Available in all pipe sizes and suitable metals, with or without secondary indicating, recording or totalizing instruments. A Flow Tube Data File is available giving full details.

### FOSTER ALSO MAKES . . .

Relief and Back Pressure Valves, Automatic Stop and Check Valves, Altitude Valves, Fan Engine Regulators, Pump Governors, Float and Lever Balanced Valves, Non-Return Valves, Vacuum Regulators or Breakers, Strainers and Sirens.

### PRESSURE REGULATORS

Foster Pressure Regulators provide the simplest automatic control of steam, liquid or gas pressures within required limits. They are available in a wide range of types and designs—direct acting for average regulation, or internal pilot-operated to provide practically instrument control; double-seated for continuous flow or single-seated for dead-end service. They are outstanding for their low maintenance requirements. Available in all suitable materials, end connections and sizes.

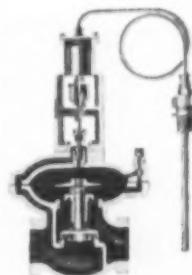


### TEMPERATURE REGULATORS

Foster Temperature Regulators are available in both pilot operated and direct acting types; single-seated to provide a tight shut-off preventing temperature creep during no-load periods, and double-seated for continuous flow. There are types for all conditions, even where sudden and extreme load fluctuations are encountered.

The essential feature of these valves is that with relatively little change in temperature, the valves will travel from a shut-off position to full opening, which considerably reduces maintenance.

Whether in a power or process plant, laundry or office building, accurate temperature regulation can be secured, maintenance costs lowered — simply and surely — through the installation of a Foster Temperature Regulator.



### SAFETY VALVES

Foster 3B-SV 'Super-Jet' Safety Valves stay tight, have high relief capacity, pop accurately, reseat with minimum blow down and are easy to service — they can be completely serviced and maintained, in the line.

For steam pressures up to 3000 Pounds.

For temperatures up to 1100°F.



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So. Carolina: Columbia—Tidewater Supply Company, Inc.  
Tennessee: Chattanooga—Edgar A. Rogers  
Memphis—C. J. Gaskell Co., Inc.  
Texas: El Paso—Steel & Engineering Products Co.  
Houston—Acme Engineers  
Virginia: Norfolk—Tidewater Supply Company, Inc.  
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## FOSTER ENGINEERING COMPANY

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AGENTS IN PRINCIPAL CITIES

(See listings under "Valves," "Regulators" and "Flow Tubes" in the Classified Section of your Telephone Directory)

## new equipment (continued)

For more data circle item code number  
on the postage free post card—p. 17

### Low Air Consumption With New Air Motor

KELLER TOOL COMPANY,  
**J-7**  
Grand Haven, Mich., is now  
producing a new line of air  
motors featuring an axial piston de-  
sign that results in low air consump-  
tion.



Keller Tool Company's new 70A series air motors are available in ratings from  $\frac{1}{2}$  to  $2\frac{1}{4}$  hp, in twelve combinations of speed and torque.

Air consumption varies from 21 cfm in the smallest to 83 cfm in the largest size motor—the low figures resulting from more efficient use of

air supply which is possible with the axial piston design.

This feature, together with absolute immunity to "burnout" when stalled, ideally suits the new motors to such application as valve closing, in agitators, tilting tables, and as variable speed drive for overhead cranes.

### Carbide-Tipped Saw Blades

DELTA POWER TOOL DI-  
**J-8**  
VISION OF ROCKWELL MANU-  
FACTURING COMPANY, 400

North Lexington Ave., Pittsburgh 8,  
Pa., has introduced a new line of low-  
cost carbide-tipped saw blades de-  
signed especially for use with radial  
saws to reduce machine downtime and  
eliminate many common blade prob-  
lems in industrial cutting operations.

## Take a good look at this critical PACKING INSTALLATION...



Style 805-MBF Used On This  
10-Stage High Pressure  
Boiler Feed Pump

This set of packings is going to handle a tough job. The pump is rated at 965 gpm, 4250' total head, handling hot (312°F.) boiler feed water at 89# suction pressure and driven by a 3850 rpm induction motor (shaft sleeves are chrome plated—675 Brinell).

There are many styles of "John Crane" Packings—but Style 805-MBF was recommended and used because it was developed and developed alone for high speed centrifugal boiler feed pumps. The natural lubricating characteristics in the design of the monel and asbestos yarn braid-over-braid construction makes it a strong, wear resistant packing. Used in hundreds of installations all over the world—it has proved to be a highly efficient, long-life, trouble-free packing that gives you the results you want.

For quick action, let our Engineering Department help you. Write for latest "John Crane" Packings Catalog. Crane Packing Company, 1839 Cuyler Avenue, Chicago 13, Illinois.



CRANE PACKING COMPANY

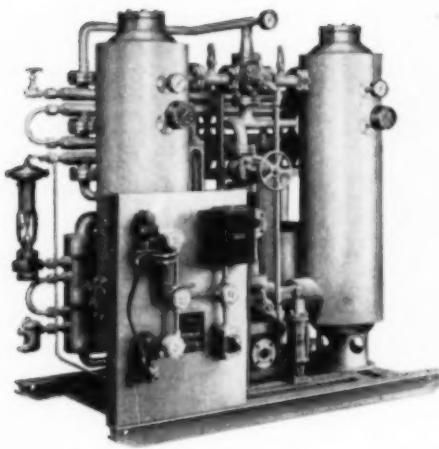


Delta Power Tool's carbide-tipped blades for radial saws are available in 10, 12, and 14 in. diameters to fit standard arbors and in 24, 30, and 36 tooth types respectively. Recommended for use with power feed attachments.

The new blades are said to last from 25 to 100 times longer than standard blades and to cut through hard or abrasive materials that dull or damage standard blades.

The carbide tips are precision-brazed to blades of special-analysis, high-quality tool steel, then diamond-wheel ground to close tolerances. Clearances are precision ground on the sides of the teeth with diamond wheels, eliminating setting or swaging of the teeth.

Because of this built-in swage design, only the carbide cutting edges touch the work, reducing friction and power loss, and also reducing the danger of kickback, making faster, smoother cutting possible.



## PROVED PERFORMANCE FOR VITAL GAS DRYING PROCESSES

Pritchard HYDRYERS\* — the *quality* packaged dehydration unit — will meet your most exacting requirements for dependable drying of air or other gases in all processing, laboratory or industrial installations.

The use of Pritchard HYDRYERS by such industry leaders as Consolidated Edison Co. of New York, General Electric Company and the International Paper Company is proof of the HYDRYERS' wide acceptance among critical buyers.

Your drying job needs the high efficiency and trouble-free operation assured by Pritchard HYDRYERS. Dual adsorbers — with solid adsorbents selected to meet your specific requirements — provide continuous drying action. Standard units are designed to reduce dew points to minus 40°F. Completely factory assembled . . . only service connections needed.

Write today for complete information on standard Pritchard HYDRYERS or special installations to meet any unique requirements. Contact your nearby Pritchard representative listed in the classified section of your telephone directory or write direct to Pritchard's General Offices, Kansas City, Mo.

\*Registered Trade Name

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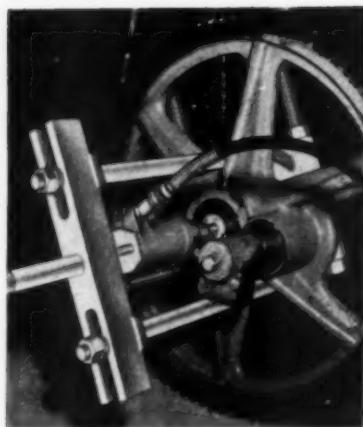
## **new equipment (continued)**

For more data circle item code number  
on the postage free post card—p. 17

### **Hydraulic Pullers**

**J-9** THE OWATONNA TOOL COMPANY, Owatonna, Minnesota, manufacturer of industrial maintenance tools and pullers, is building a hydraulic unit in three sizes specifically for use with pullers. Available are units of 17½, 30 and 50 ton capacities for use with puller units of comparable size and capacity.

Because of their construction these hydraulic rams are known as POWER-TWINS, deriving their name from the twin cylinders. The hole between the twin cylinders permits fast adjustment to the work by means of a threaded adjusting screw. In addition, it allows ready interchangeability of pullers, attachments and adaptors of which a full range is available, making it a "system" which can be readily adapted to pulling problems involving the removal of gears, bearings, pulleys, sheaves, cylinder liners, couplings, shafts, pinions and other tightly fitted parts.



Pulling a large gear with an Owatonna Tool Company Y-32, 30 ton hydraulic unit used in connection with a Push-Puller and Pulling Attachment.

The pullers are activated by a remote control pump with six feet of high-pressure hose. This enables the operator to stand at a safe distance when extreme pressures are used. A gauge which measures the strain in pounds and tons of pressure permits use of the equipment to its maximum capacity.

### **Air Inlet Castings for Wood Burning Furnaces**

**J-10** GEO. P. REINTJES COMPANY, 2517 Jefferson St., Kansas City, Mo., has developed an air inlet cast block having outside dimensions of  $2\frac{1}{2} \times 4\frac{1}{2} \times 9$  in., for use in construction of dutch ovens of bagasse and wood burning furnaces.

Previously it has been general practice to install metal air inlet openings with outside openings  $2\frac{1}{4} \times 2\frac{1}{4} \times 9$  in., the same as a brick soap. This leaves an approximate square opening of  $1\frac{1}{2} \times 1\frac{1}{4}$  in. in cross-section. Thus, when brick work laid with a header bond is  $4\frac{1}{2}$  in. wide, it is difficult to build a substantial wall without the breaking of bond wherever the inlets occur.

The new Reintjes development is designed to maintain the brick bond and yet not increase the air openings, by use of a venturi type of air inlet. The cross-section thickness of the metal is no greater than is now used. Horizontal external ribs are used to form a rest for the overlapping of the brick. The casting is formed in two pieces, eliminating use of cores in manufacture. The pieces are fastened together against shifting inwardly. Pressure

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with worthwhile savings**

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**IRONTON  
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3000° F.**

**IRONTON  
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**IRONTON FIRE BRICK COMPANY  
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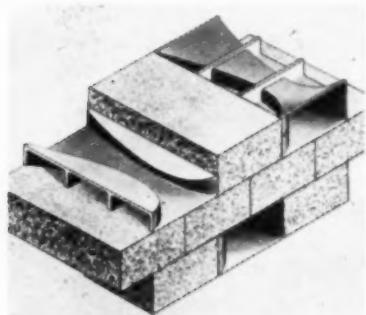
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**FIRE BRICK COMPANY**  
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Kentwood, La. - - - Phone 2191

## new equipment (continued)

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Geo. P. Reintjes Company's venturi type air inlet casting for bagasse and wood burning furnaces

drop of air passing from outside into the furnace is reduced to a minimum. The venturi action as well as the slope of the casting reduces the tendency of the air inlets to clog.

### Reducing Valve

LESLIE Co., Lyndhurst, J-11 N. J., has added to its line new small flow bronze or steel reducing valves for steam, air, gas, or liquid service.



Leslie Company's small flow reducing valve handles inlet pressures to 1,000 psi and reduced pressures from 2 to 400 psi.

These valves have a wide variety of applications in molding plants, pilot plant operation, laboratory units, sterilization plants and other fields where small flows have always been a problem.

### Another Beaumont Birch Ash Handling Installation

Discharge end section of a flooded hopper for Beaumont hydraulic system showing rugged supporting structure and circular protected observation ports of special heat resistant glass.



## Why BEAUMONT BIRCH Hydraulic Ash Handling Systems Assure You Reliable, Efficient Service

In every detail of Beaumont Hydraulic Ash Handling Systems, you'll find they're designed for practical considerations of boiler efficiency, operating safety, minimum man-hour attention and minimum maintenance.

For example, on flooded hoppers beneath pulverized coal fired boilers, costly shut downs are never necessary when water jet nozzles in the ash hopper require replacing. They are easily and safely replaced *while the boiler is in operation* . . . the rugged sluice gate and operating cylinder are mounted on a single casting, completely shop assembled. This assures perfect alignment of cylinder for long uninterrupted service.

On flooded hoppers, operators are always protected at observation ports by special glass resistant to thermal shock, in addition to a protecting metal guard. Built-in spray washers keep all observa-

tion ports clean and free from dirt and fog.

These and many other points, such as, sluiceways, sumps, dewatering bins, flyash handling systems and other supplemental equipment are only a small part of the attention to details that are characteristic of Beaumont Birch Systems.

Power and Consulting Engineers specify Beaumont Birch Hydraulic Ash Handling Equipment because they are assured of design, engineering and construction to exacting specifications!

Beaumont's background of over fifty years in the design and manufacture of ash handling systems gives you long service life with a minimum of maintenance.

For complete details of the many efficiency and economy features of Beaumont Hydraulic Ash Handling Systems, call in a Beaumont Birch engineer or write direct.



**Beaumont** BIRCH COMPANY

1519 RACE STREET, PHILADELPHIA 2, PA.

DESIGNERS — MANUFACTURERS — BULK MATERIAL HANDLING SYSTEMS

# Maintenance Procedures

## Section 7

Vinyl type coatings . . . bladeless trash pumps . . . abrasion controlled . . . automatic self-cleaning filters . . . cleaning storage tanks . . . testing and calibrating . . . power tool for bolting up boiler casings

### Case 52—Texas

#### Power Saw Splits Heavy Conduit With No Damage to Cable Sheath

AN UNUSUAL application for the Black & Decker 6 in. Deluxe Portable Electric saw has been developed by Julius E. Dry, owner of The Superior Electric Co., of Dallas, Texas. Mr. Dry uses a 6 in. abrasive disc on his Utility saw to split collars and side walls of heavy conduit without damaging the enclosed cable.

#### Fire Damage

Such a job was done in Paris, Texas, that resulted in a saving of a \$1,300 cable. A large industrial building had been completely gutted by fire. The owners' problem was to put the burnt-out building and machinery back in service as soon as possible. The Superior Electric Company was called in from Dallas to help solve the rewiring problem.

Heat from the fire had melted off the 12,480 volt three-conductor cable at the floor level, leaving nothing but a burned stub which was too short to splice new cable to. However, the rest of the cable going outside the building, under the walk, and up the pole to the trans-

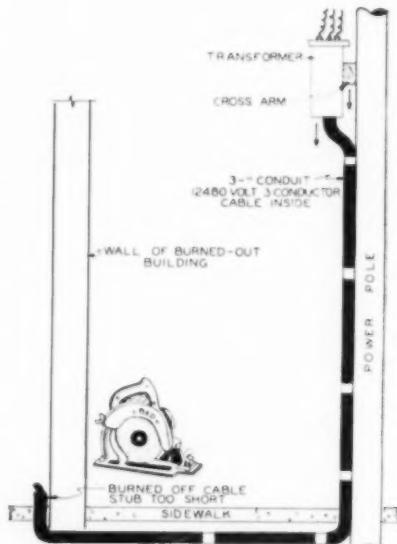
former, was in perfect condition. It represented an investment of approximately \$1,300. Could the cable be saved?

No one had ever tried to cut conduit with cable inside, as far as the electricians knew. Here's how they did the job:

#### Repair Method

Superior Electric's men put on their thinking caps and came up with a solution that saved the cable and gave enough lead inside the building so that new cable could be spliced on up to the new switchgear. They removed one short section of the 3½ in. conduit without hurting the cable sheath, lowered the transformer and crossarm on the pole and pulled the excess cable into the building for splicing.

Collars top and bottom were easily split and removed with a Black & Decker Deluxe 6 in. saw with abrasive disc, making sure not to touch the cable. Collars were split nearly through but allowed to stay in place in order to align the conduit for splitting. A 2 x 4 timber



Problem was to gain enough cable to connect new switchgear without replacing \$1,300 3-conductor cable.

was clamped with C-clamps top and bottom to act as a guide for the electric saw with disc attached.

Since the cable could be damaged by heat as well as cutting, two cuts were made down each side of the conduit. The first cut was made a little over half way through the 1/4 in. wall and the conduit allowed to cool. The second cut was made to within 1/16 in. or less of the total remaining thickness. This left a



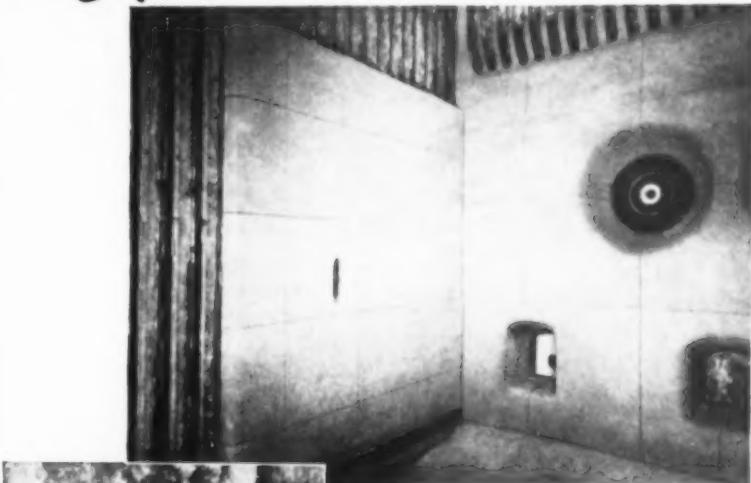
Solution—Collars and section were split (using a Black & Decker Utility 6 in. saw with abrasive disc) and removed. Transformer and conduit were lowered and rejoined, gaining cable for inside building. Job took only 2½ hours and saved \$1300 worth of cable.



thin wall section that was knocked out by hand with a screwdriver. The collars were then removed and the two halves of the 42 in. section removed.

At no time did the abrasive disc heat enough to discolor the metal. The operation was so smooth that the thin-wall section was never breached, hence the valuable cable was never heated up or touched. The job took 2½ hours to complete and saved \$1,300 worth of cable. The alternative would have en-

# Big job or small...



*you can depend on*  
**PLIBRICO**

For all furnace linings—from the smallest heating boiler to the largest steam generator—there's a Plibrico refractory product exactly right for the job! What's more, you can't beat a Plibrico setting for permanence. Here's why:

#### FIRST...

Plibrico refractories are adaptable for any lining. Plibrico Jointless Firebrick, for example, is *plastic*—conforms readily to any desired contour. Where a castable refractory is required, you'll find nothing more permanently effective than Plicast. Both types form monolithic linings, free from the weak joints that cause trouble and expense.

#### SECOND...

Plibrico offers, too, the construction features that make Plibrico furnace linings more lasting, more dependable, more economical. Flexo-anchors, Taperlok supports and other Plibrico-designed equipment make a good lining job better and more enduring.

#### THIRD...

In addition, Plibrico can offer you a complete engineering service from blueprint to final boiler setting. Yes, whether your job is big or small, you can depend on Plibrico!

Your local Plibrico Sales & Service engineer will be glad to quote on any of your needs. Write or call us . . . for your copy of the Plibrico catalog.

## Plibrico Company

1838 Kingsbury St., Chicago 14, Ill.

PLIBRICO SALES & SERVICE IN PRINCIPAL CITIES

REFRACTORY PRODUCTS • ENGINEERING • CONSTRUCTION



REG. U.S. PAT. OFF.



High grade gas, by-product, steam and household stoker coal from Wise County, Virginia, on the Interstate Railroad.



High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.



High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.



The Premium Kentucky High Sulfur unmatched for domestic use. Produced in Harlan County, Kentucky, on the L. & N. Railroad.

**COKE**

Roda and Stonega from Wise County, Va.



High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.



High volatile domestic, steam and by-product coal from Boone and Logan Counties, W. Va., on the Chesapeake & Ohio Ry.



Genuine Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railway.



High fusion coking coal for by-product, industrial stoker and pulverizer use from Wyoming Co., W. Va., on the Virginian Ry.

### ANTHRACITE

Hazel Brook—*Premium Lehigh*  
Raven Run—*Premium Mahanoy*  
Cross Creek—*First Grade Lehigh*

Our engineering service, available upon application, and long and varied experience is your assurance of the Right Coal—Properly Applied.

## General Coal Company

123 SOUTH BROAD STREET

PHILADELPHIA 9, PA.

CABLE ADDRESS, GENCO

#### Branches:

BLUEFIELD, W. VA.  
CLEVELAND

BUFFALO  
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CINCINNATI  
NORFOLK

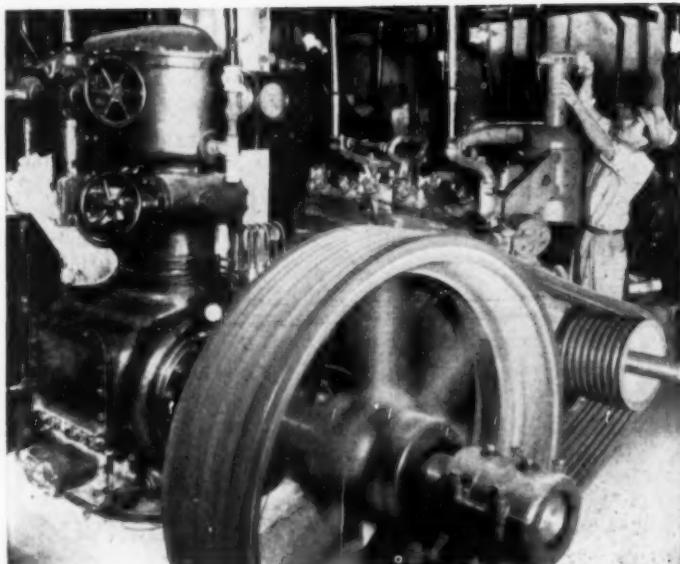


## Refrigeration

Paid for itself promptly when the electric power failed at the plant of Empacadora y Refrigeradora de Coahuila, across the river from Eagle Pass, Texas. This Mexican packing house installed a Frick compressor and International Harvester gas engine as standby equipment.

E. M. Salvos, superintendent of the plant, writes: "Compressor and engine have already paid for themselves in one 72-hour emergency. We store as much as a million and a half pounds of frozen meat in our lockers at one time. This is the cheapest insurance we can buy."

Get figures now on Frick refrigeration to meet YOUR needs: write



Frick 10" by 10" ammonia compressor which paid for itself in one emergency in a packing plant at Piedras Negras, Mexico.

DEPENDABLE REFRIGERATION SINCE 1881  
**FRICK CO.**  
WAYNESBORO, PENNA. U.S.A.

Also Builders of Farm and Sawmill Machinery

tailed melting 69 lb of insulation wax in the transformer to get to the connections, removing the old cable, and threading the conduit with \$1,300 worth of new cable . . . a very expensive job taking about two days.

#### Case 53—Florida

#### Lime Kiln Repair

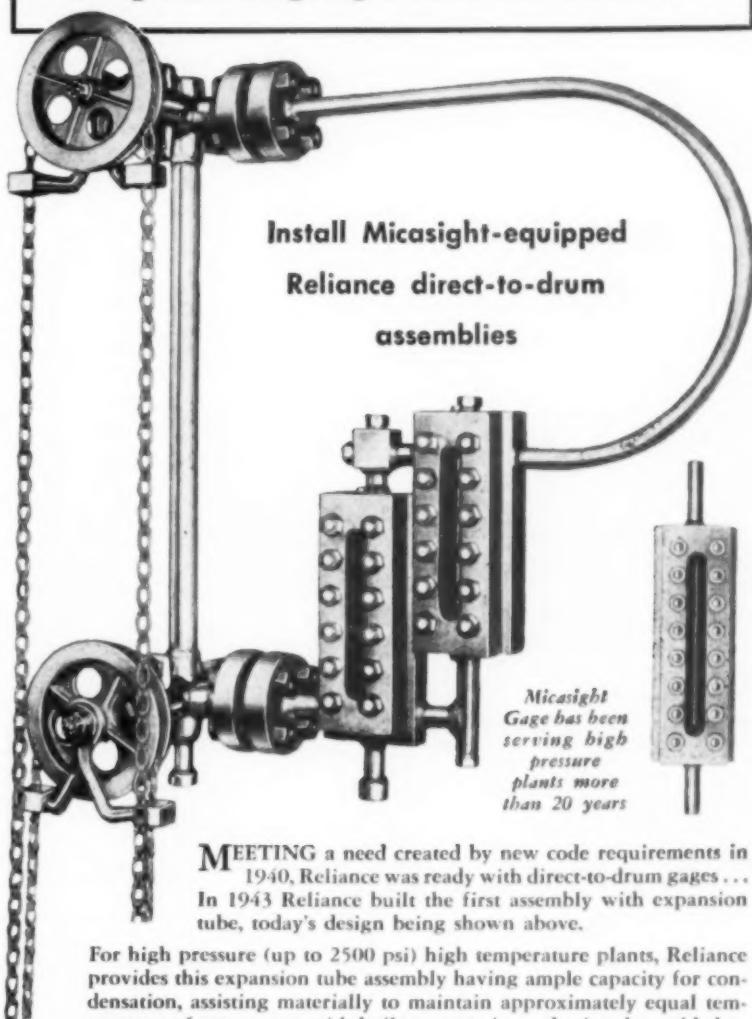
It recently became necessary at a Southern paper mill to effect repairs to one of its rotary lime kilns. The nature of the repair called for turning the trunnions and tires in order that the kiln could be re-aligned and to regain the true and full bearing surface between the trunnions and tires as the kiln turns.

The job was done in a novel way with the kiln running. The machine shop designed and manufactured a simple compound mechanism long enough to cause (by manual feed) a lathe tool to be carried across the width of the trunnion. The frame holding the compound was laid out to bear on and fasten to the trunnion housing. When one trunnion was turned the jig was simply moved around to the opposite side, the tool inverted and the other trunnion turned.

The tire presented a more difficult problem because the shifting of the lime within the kiln and the fact that the tire is not welded to the kiln causes the tire to keep changing its position. However, the same compound was used and a seat for the compound was built to accommodate the job. The compound was aligned parallel to the center line of the kiln so the trunnions could be realigned with the tire. The tire was then satisfactorily turned and the entire job completed in a manner to meet requirements without any loss of production.

The safety department came through with a heat reflecting material that was made up into shields back of which the workmen worked without too much discomfort.—A. O. Mortenson, Chief Operating Engineer.

## Stop gage glass breakage on your high pressure boilers



MEETING a need created by new code requirements in 1940, Reliance was ready with direct-to-drum gages . . . In 1943 Reliance built the first assembly with expansion tube, today's design being shown above.

For high pressure (up to 2500 psi) high temperature plants, Reliance provides this expansion tube assembly having ample capacity for condensation, assisting materially to maintain approximately equal temperature of gage water with boiler water. A sturdy tie-tube welded to both Reliance Gage Valves gives necessary rigidity between boiler connections. Reliance all-welded gage assemblies have more than sufficient ruggedness to meet severest conditions.

Extra gage-reading safety and long window life is assured by the exclusive Micasight Gage which uses non-shattering mica windows securely clamped in short, wide-bar, non-breathing bodies. Reliance provides access to clean out all passages, with entrances guarded by non-freezing plugs. Gage is connected to valves by ring-joint flanges — no nipples or packing glands. The Micasight is the safest water gage known. Write for full information, to the factory or your nearest Reliance representative.

RELIANCE GAUGE COLUMN CO., 5902 Carnegie Ave., Cleveland 3, Ohio

**Reliance®**  
BOILER SAFETY DEVICES

## Case 54—S. C. Textile Mill

### Vinyl Type Coating Protects Fans & Ducts

PLANT engineers at The McCormick Spinning Mill, Inc., at McCormick, South Carolina, had the problem of protecting air conditioning ducts and fans against corrosion.

To establish optimum protective procedures and materials, they tried several coating formulations and have recently reported very satisfactory results with a modified vinyl type coating material—Bisonite "M"—a product of the Bisonite Company, Inc.

Applicational method, specified by Bisonite Company's Southeastern distributor, Southern Lead Burning Company, of Atlanta, Georgia, was as follows: Sandblast, one coat Bisonite M100 Primer; and 4 top coats of the Bisonite M100 series in alternate colors, finishing with the color desired.



One of the Bisonite coated fans being inspected by a McCormick Spinning Mill engineer. Protective coating was in excellent condition after 8 months service. Bisonite "M" coating systems will adhere to steel, wood, stone, brick, rough tile, etc. Application is easy but instructions must be followed. Another Bisonite "M" application in an Alabama bleaching and dye plant is shown at the right. Representatives of the Bisonite Company are inspecting (right) the ductwork and fans which remove acid and alkali laden air from the processing operations. Excellent service record is reported.

Alternate color top coats provide several advantages. They serve as a guide to the applicator for uniform work and the consumption of material. They eliminate the possibility of missed spots and aid in doing a complete job under some-

times difficult seeing conditions. Damage may occur to coatings or in time the coating will wear due to abrasion. A different colored undercoat showing through is an excellent and easily discernible signal for preventive maintenance.

**SIMPLIFY and SAVE**  
on lubricating work with

**ALBANY**  
PRESSUREGREASE  
*Universal*



Hundreds of plants now use this Improved All-Purpose Lubricant for:

Albany Pressuregrease Universal takes the place of four or more separate greases used heretofore . . . cuts down inventory and calls for only one grease gun . . . speeds up lubrication work and saves you money.

Engineers like the way Albany Pressuregrease Universal clings to metal at all temperatures. Its high resistance to moisture prevents rust. Assures cleaner floors because it will not run off at high temperatures or high speeds. Ask for it at your mill supply house.

1. Regular Pressure Grease
2. Ball and Roller Bearing Grease
3. Water Pump Grease
4. Universal Grease and for many other types of equipment

FREE:  
Send today for helpful copy of Albany Recommendation Chart



**ADAM COOK'S SONS, INC.**  
LINDEN, NEW JERSEY

**Albany Lubrication Products**

Southern Representatives: E. E. McCARTHY, 1312 Poinsettia Ave., Orlando, Fla.  
J. H. MENGE CO., 932 Nat'l Bank of Commerce, New Orleans, La.

## Case 55—Georgia

### Bladeless Trash Pump

THE Austell Box Board Company of Austell, Georgia, has installed a new bladeless trash pump to solve a pumping problem that has been a headache for years.

The pump is a 4" x 4" Fairbanks, Morse Fig. 5432 trash pump with bladeless impeller and is installed in the basement sump to pump the settling from the processing tanks to the disposal area.

This company makes its product from scrap paper that is reprocessed, and was faced with the problem of pumping bottle-caps, gem clips, string, wire, bits of glass, and rocks out of the sump when the tanks were dumped for cleaning.

Several types of pumps were tried and all had to be stopped at intervals, raised from the sump and the impellers and volutes cleaned out. This of course meant hard work and wasted time.

The Fairbanks, Morse pump specified was a close-coupled, dry-pit type pump, but was ordered less

the base and with a bell suction. This enabled the company engineers to suspend it in the sump on iron straps in position where when the tanks were dumped and the sump filled, the volute would be covered, making priming unnecessary, and yet it would be impossible to flood the motor.

There has been no pumping problem on this installation since the bladeless pump was installed.

#### Case 56—Georgia Paper Mill

#### Pump Failure Easily Solved

**I**N 1947 it became necessary to add a chlorination stage to the Bleach Plant of the Brunswick Pulp & Paper Company at Brunswick, Georgia. The stock was supersaturated with chlorine, therefore a very corrosive condition existed at the point where pumping was necessary. Warren rubber-lined Type 8-A-17 Pumps were decided upon. These pumps would have been successful had it not been for the fact that small pieces of tramp-iron occasionally entered the system, a condition which was not anticipated at the time of the installation. These pieces of foreign material, such as nails, wire, etc., would cut the rubber lining and allow the chlorine solution to come in contact with the cast iron body of the pumps. The chlorine solution would immediately start dissolving the body of the pump, causing not only pump failure but also allowing iron impurities to enter the stock.

Warren Steam Pump Company was consulted and recommended 8-A-17 Pumps with type 316 stainless steel bodies and impellers. With these pumps all of the metal contacted by the stock is stainless and not attacked by chlorine.

J. A. Corbitt, maintenance engineer and master mechanic of Brunswick Pulp & Paper Company, says that at first they inspected the pumps every six months but as it became apparent there was no deterioration of the metal, the inspections were made only when other portions of the mill forced interruptions. These pumps have been in continuous operation since 1948 with no repairs of any kind.

**Okadee**  
"THE PERFECT SEAL"  
**WRING FIT**

VALVE DISC

VALVE SEAT

No magic... No magnetism... Lapped wring fit of every Okadee Valve disc and seat must pass this test of a perfect sealing surface. (unretouched photo)

#### ... Here's What it Means to You in Terms of Valve Service

Flat mating surfaces within .000005", or less, of every set of Okadee valve discs and seats mean absolute shut-off of any material from ammonia gas to asphalt.

How long does this seal last in service? We honestly don't know. Tests under working conditions with propane were stopped after 269,000 operating cycles when no wear or seal failure could be detected. And Okadee valves do not have to be babied in service on corrosive or abrasive materials . . . Thousands of boilers have had Okadee blow-down valves in continuous, trouble-free service for fifteen years or more. If Okadee size-pressure-temperature ranges include your valve applications, Okadee installation will end your problems of valve performance once and for all.

Okadee valves are available in single-disc (one direction) and double-disc (two directions) types; screwed or flanged;  $\frac{1}{2}$ " to 6" in standard A.S.A. dimensions; steel or semi-steel bodies (other materials to order); stainless steel or stellite seat facings; levers, rack-and-lever, worm-gear, hydraulic, pneumatic, automatic on-off control.

Write for Bulletin 332-H today!



## Case 57—Kansas Mill

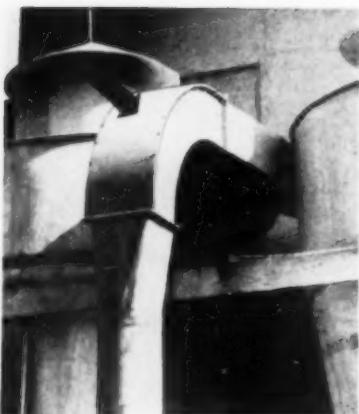
### Abrasion Controlled

**I**N Topeka, Kansas, the Topeka Mill and Elevator Company, processors of flour, grain and feed, has a pair of cyclone separators to handle screenings.

Screenings are passed through a hammermill and blown 96 ft up through the elbow shown in the picture. Originally this elbow, 8 in. square on a 3 ft radius, was made of 16 gauge steel sheet. The elbow has a replaceable flat plate on the outside. Plain steel plate lasted about three weeks and cost about \$45.00 to install.

A Gates Engineer told Mr. Paul Bailey, Superintendent, and Mr. Ford, Maintenance Foreman, about Gates Rubber Faced Steel Plate. This material can be fabricated into spouts, pipes, chutes and liners and resists abrasion many times longer than hard steel.

Mr. Bailey ordered enough Gates



Arrow indicates the Gates Rubber Faced Steel Plate installation in the Topeka, Kansas, mill.

Rubber Faced Steel Plate to make a replacement elbow for the screenings separator line. The outside Rubber Faced Plate lasted twenty-six months. The other parts of the elbow are still in service.

A little quick figuring shows that at \$45.00 for three weeks service, the ordinary steel plate was costing \$15.00 a week to maintain. This,

times 112 weeks (the life of the Rubber Faced Steel Plate), would have cost \$1,680.00. Subtracting \$95.00 (the cost of the Rubber Faced Steel Plate installation) gives a net saving of \$1,585.00 for this one elbow in a little over two years.

## Case 58—Louisiana

### Automatic Filters

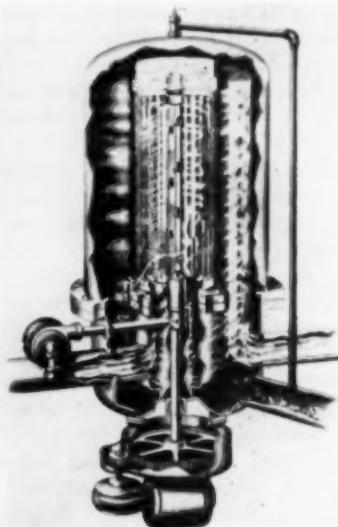
**W**HILE the problem of removing solids from raw river, lake or well water to protect plant equipment and reduce maintenance costs is widespread, it is particularly prevalent in pulp and paper and primary metal plants. In such industries, spray nozzles must be kept clean to prevent clogging and expensive shutdowns.

A typical installation was recently completed to remove particles measuring .0125" or larger from the Mississippi River for an aluminum reduction plant. There are 64 scrubbing towers, each with 14 spray nozzles, requiring a total of 10,600 gpm of filtered water. Of the 14 spray nozzles in each tower, the 8 high pressure fog nozzles have the smallest opening which is approximately .030".

Two continuously automatic self-cleaning Cuno Flo-Klean filters complete with automatic blowdown assembly were installed on this river water supply system.

Tubes  
All standard sizes  
and extra gauges  
ACCURATELY  
FABRICATED

BOILER TUBE CO. OF AMERICA  
McKEES ROCKS, PA.  
(Pittsburgh District)  
PITTSBURGH • CHICAGO • FRED S. RENAUD & CO., LOS ANGELES



A continuously automatic self-cleaning Cuno Flo-Klean filter.

## Case 59—Oklahoma

### Storage Tank Cleaned

CHANGES in product storage necessitate thorough cleaning of the storage tank. A large Southwestern chemical company recently desired to clean and prepare a 50,000-bbl fuel oil tank for conversion to ethylene glycol storage. The tank was completely cleaned and readied for service using thickened chemical solvents and techniques developed by Dowell Incorporated, specialists in chemical cleaning problems.

The oil tank was 40 ft high by 100 ft in diameter and was of welded steel construction. The conical roof was supported by 13 steel columns placed in rows across the tank. All internal tank surfaces were covered with a rust deposit coated with an oil film. Approximately 4 in. of residue had accumulated on the 7850 sq ft of floor area.

#### Chemical Method

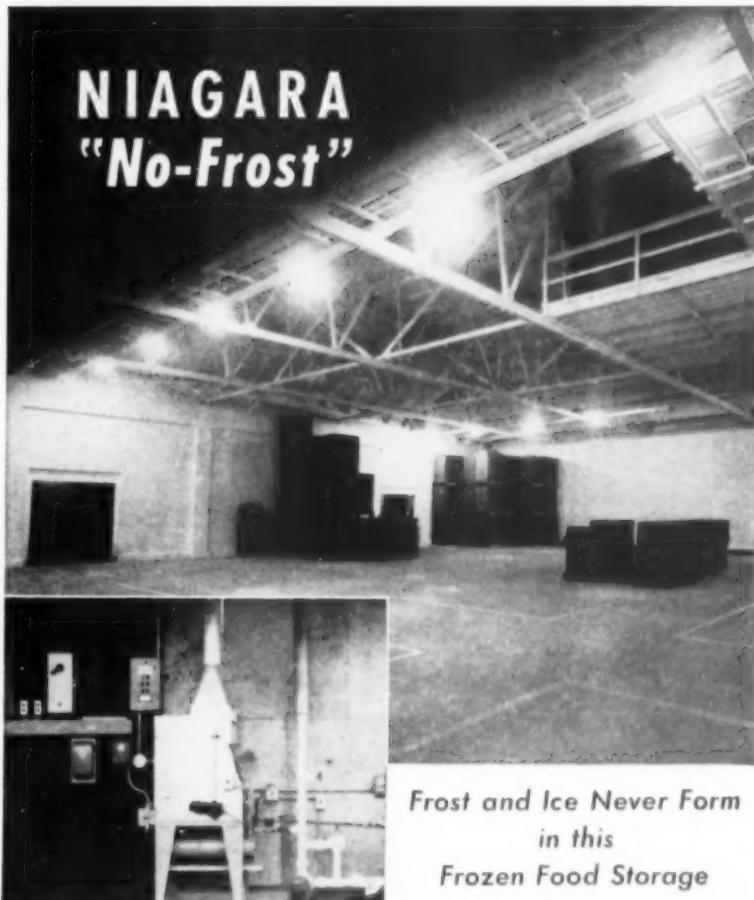
Initial cleaning operations on this tank required about four days, during which time water, under high pressure, was used to wash down the ceiling, walls, stanchions and floor. Cleaning was slow during this stage because of the necessity of working without lights inside the tank.

Following the initial washing of the tank, 5000 gallons of Dowell's thickened inhibited acid was sprayed on all interior surfaces. This thickened solvent is designed to cling to tank walls and ceiling while it dissolves off the deposits.

When operations were resumed the next morning the tank was given a thorough washing with water under high pressure. An alkaline solution containing a wetting agent was then jetted over the interior of the tank to insure the complete removal of any remaining traces of oil and disintegrated oxides.

This chemical cleaning procedure resulted in a completely successful cleaning treatment. An inspection showed the tank to be completely free of all oxides and oil, and the operator immediately began pumping glycol into the tank for storage.

## NIAGARA "No-Frost"



Frost and Ice Never Form  
in this  
Frozen Food Storage

### SAVE TROUBLE AND EXPENSE EVERY DAY IN PRE-COOLING, FREEZING AND STORAGE; PROTECT FRESH OR FROZEN FOOD QUALITY

The Niagara "No-Frost" Method gives you always the full capacity you paid for in your refrigeration, NEVER, not even partially, interrupted for defrosting. You can handle large "live" loads easily. The controls are simple and always give you accurately the temperature and humidity you want. Temperatures never rise to interrupt the "pull-down". You are free of troubles; your rooms stay clean and sweet with easier maintenance and less labor. You save power; your compressors run at higher suction pressures. For every refrigerated room for temperatures below 32° F. this method gives you better product quality at lower operating costs. Many of the finest installations in the industry, both large and small, prove the benefits of the Niagara No-Frost Method.

Write for the No-Frost story and data on its application to your problem. Ask for Bulletin No. 105.

**NIAGARA BLOWER COMPANY**  
Dept. SP, 405 Lexington Avenue, New York 17, N.Y.

**OVER 15 YEARS OF SUCCESSFUL EXPERIENCE  
PROVES THE VALUE OF NIAGARA NO-FROST**

## Case 60—Florida

### Testing—Calibrating Protective Devices

A PORTABLE high current test unit—The Industrial Multi-Amp, a product of Multi-Amp Corporation—is being used by the Talquin Electric Cooperative, Inc., Quincy, Florida, for the checking and calibration of current actuated and protective devices.

Richard Minton, operation superintendent, reports that the company has made greatest use of the Multi-Amp in testing oil circuit reclosers and sectionalizers. It is their standard maintenance procedure to bring these devices into the shop periodically for routine maintenance and the use of the test unit has proven very successful in calibrating their operating cycle. They also use the Multi-Amp to check CSP transformer secondary breakers, house type breakers, and recording ammeters.



Testing any current-actuated device merely entails connecting the device to the proper output terminals of the Multi-Amp and adjusting to the proper value while observing a current indicating instrument and timer. When the results are checked against the manufacturer's published time-current curves or against a "typical calibration table" the result is a quick, easy test which lets you know positively whether or not your protective devices are really protecting.

## Case 61—Virginia

### Chain Lubrication

LIGHT spindle oil with the addition of self-lubricating metallic solids is proving to be an effective lubricant for chains operating in extreme heat and dust environment.

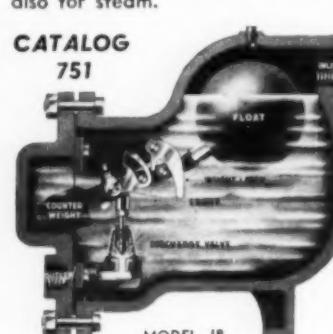
The base oil used in this product acts as an effective carrier for the metallic solids and consequently has broadened the ordinary applications of extremely light oils as a lubricant. The light oil base penetrates into the pins and bushings of the chains and evaporates, leaving no gummy or carbon residue. During this evaporation process the metallic solids are deposited on the sliding surfaces at "wear points"—thereby reducing wear and friction to a marked degree.

The most important of the lubricating solids in the spindle oil manufactured by Imperial Oil and Grease Co. is molybdenum disulfide. This product has been used for some time by a large Virginia utility company to lubricate chains on the coal conveyor drive. Previously reclaimed oil from the truck fleet was used, but advantages of the light oil with molybdenum disulfide far outweighs the "no-cost" feature of the waste oil previously used.

## Solve Sludge Problem with Nicholson's New AIR TRAPS

With the introduction of an exclusive new oil-eliminating feature, Nicholson air traps now enable you to enjoy the advantages of the positive intermittent action of a float-operated air trap without the common problem of oil congealing on the mechanism and impeding or stopping its action. Other features of Nicholson air traps:

- 1) No air-wasting vent, such as is in all inverted bucket traps.
- 2) Positive water seal of valve.
- 3) Large orifice keeps valve clean, preventing blow-through.



175 Oregon St., Wilkes-Barre, Pa.

**W. H. NICHOLSON & CO.**  
TRAPS • VALVES • FLOATS

## Case 62—Alabama

### Corrosion Problem

FOR several years maintenance engineers of the Brown-Marx Building, a large office building in Birmingham, Alabama, experienced a serious metal surface protection problem.

They are now using DeRusto, a rust preventive paint manufactured by the Master Bronze Powder Co., on outside metal surfaces, including steel water tanks, condenser tower and steel water pans. Results have been very satisfactory, particularly in combating a slightly acid water condition in water pans. A considerable reduction in painting costs was also emphasized by building maintenance personnel.

## Case 63—Texas

### Bolting Up Boiler Casings

A BOILER service and repair company has found that it can cut the overall time on installing boilers by as much as 1/3 or more with the Ingersoll-Rand electric Impactool for bolting up the boiler casing. The time on a 27 hour job is reduced to 8 hours. On a larger job, which took 14 days to complete, bolting up the casing took one man four hours when working with the power tool.



Ingersoll-Rand's Impactool.

It usually takes two men, working with hand wrenches, two 8-hour days to complete this same job of bolting up 2500-3000  $\frac{3}{8}$ " nuts on the casing of a 350 hp oil-fired steam generating unit. Here the tool accomplishes in 4 hours a bolting job that ordinarily takes 32 man-hours by hand, or a saving of  $\frac{7}{8}$  or 87% of the time.

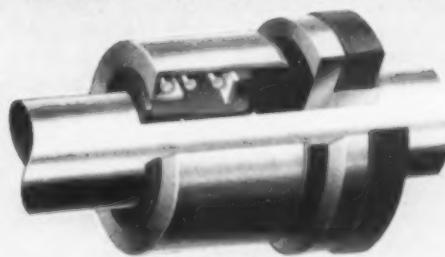
## Case 64—Southeast

### Pipe Cleaning

A SOUTHEASTERN utility was running a high voltage line to a sub-station. This line runs through an oil-filled pipe. The internal finish of the pipe is most important to avoid damaging the cable when pulling it through (average length pulled was about a mile). Ordinarily the pipe is

## Garlock "Package" Seals FOR ROTATING PUMP SHAFTS

Type BB-21A—Garlock Package Seal of standard construction with brass shell, brass washer, and Buna-N bellows.

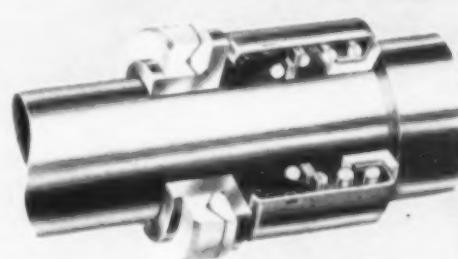


### TYPE BB-21A

Liquids	For water, oils, alcohol, solvents (except aromatic, chlorinated and ketone types) and other liquids (except strong acids).
Equipment	Rotating shafts of centrifugal pumps, process pumps, chemical pumps, agitators and similar applications.
Sizes	For shafts from $\frac{3}{8}$ " to 3" diameters.
Temperatures	With Buna-N bellows up to 212°; with silicone bellows up to 450° F.
Pressures	Up to 150 p.s.i.
	Up to 150 p.s.i.

### TYPE AA-21A

For very strong acids, oils, solvents (including aromatic, chlorinated and ketone types) and all other liquids.



Type AA-21A—Garlock Package Seal with hat-shaped "Teflon" drive ring, brass or 316 stainless steel shell and washer, "Teflon" "O" ring, and "Teflon" two-piece vibration ring.

### ✓ CHECK THESE IMPORTANT FEATURES

- Occupy very small space
- Proven performance at low cost
- Completely assembled—ready to install
- Both types are dimensionally interchangeable

In both of these Package Seals, a leakless seal is provided by a positive contact between carefully lapped metal-to-carbon mating surfaces. All metal parts in both types are available in plated-brass, Ni-Resist, stainless steel with malcomized face, Garlock "B" iron, and others.

For complete details, ask your Garlock representative or write us about your sealing problems.

THE GARLOCK PACKING COMPANY  
PALMYRA, NEW YORK

In Canada: The Garlock Packing Company of  
Canada Ltd., Toronto, Ont.  
*Branch Offices in Most Principal Cities*



PACKINGS, GASKETS, OIL SEALS,  
**GARLOCK**,  
MECHANICAL SEALS,  
RUBBER EXPANSION JOINTS

flared for their welding process. However, a run of sub-standard pipe split in the flaring operation.

Their engineers felt that part of their problem could be overcome by eliminating half of the flaring and by butt welding the pipe if a method could be found to remove the welding "cherries and splatter" from the inside of the pipe. A Thomas C. Wilson EP motor and Model "R" head solved their difficulty and saved many lengths of pipe which otherwise would have been scrapped.

trol, namely, materials and supplies and tools. The purpose was to improve the overall efficiency of this particular operation.

Two VISIrecord visible vertical record keeping units were installed—one for their Material & Supplies Stock Record and the other for their Tool Inventory Record. This equipment proved so satisfactory that a third installation was initiated for their larger General Stores Inventory Record.

The VISIrecord equipment is designed so that any record in the file can be found in seconds. The visible margins of the forms bear information as to the identity of the item, balance of this item on hand, and reorder points. Without removing a single record from the file, but by merely scanning the records determination is made as to when to order and the status of items on hand.

The system has considerably reduced the time necessary to maintain these records.

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 6th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

## Materials Handling

(Starts on page 80)

pushing as many as four loaded cars they had to "bump" their way up grades, according to company spokesmen. But now, with Diesel power operating through torque converters, they provide smoother movement of the cars under all conditions.

### Case 65—Southwestern Utility

#### Stock and Tool Control Records

EARLY in 1952 the Dallas Power & Light Company determined to establish the best possible record keeping system for two phases of their stores con-

### Case 66—Georgia

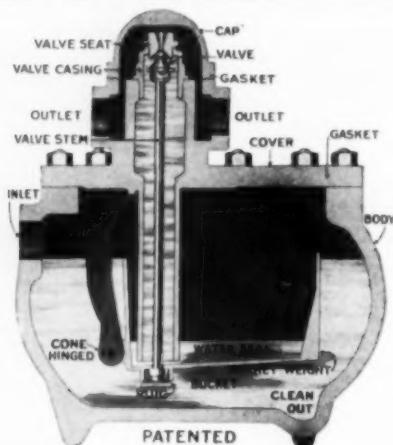
#### Prefab Production With Tramrail

THOUSANDS of the trim, prefabricated houses turned out on an assembly-line basis by the Knox Corporation, Thomson, Georgia, now dot the landscape in the Southeast. People take to them because they are good quality buildings, carefully engineered to secure maximum space, convenience and general home comfort for dollar expenditure.

One of the most important factors in keeping costs down is the use of modern production-line methods, employing jigs for accurate assembling of parts and Cleveland Tramrail overhead equipment for serving the lines as well as for nearly all other handling of materials. The panels vary in weight from 50 to 1800 lb. and are up to 32 ft. in length, making them very awkward to handle. Yet by the use of the overhead track system and electric hoist carriers, they are handled quickly and easily.

When Tramrail was installed over the jig tables, the time required to turn panels over for surfacing the other side was cut in half of that required by former hand methods. Assembly-line output reduced production cost per house by 17% in one year.

ONLY  
ONE  
MOVING  
PART



#### in a Squires STEAM TRAP

Over the long pull, Squires Steam Traps are the LEAST EXPENSIVE to own and operate. These are the reasons why: (1) There is only ONE moving part—the bucket hinge. (2) The larger capacity in both orifice and bucket mean fewer discharges, less wear. (3) You don't have to break main line connections to get at the valve and seat. You can't beat Squires for economy of operation. It is one steam trap you can INSTALL and FORGET. Write today for complete details. Ask for Catalog No. 100. Write us concerning traps for testing purposes.

IN MANY INDUSTRIES FOR OVER 40 YEARS . . .  
DEPENDABLE SQUIRES TRAPS ARE IN DAILY USE

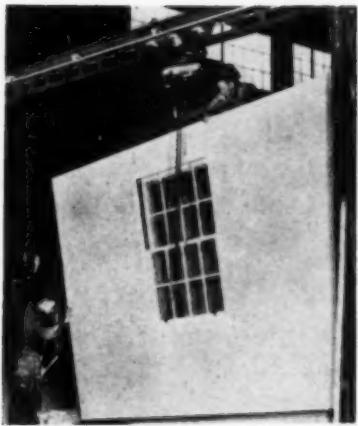
Steel — Pulp & Paper — Meat Packing — Public Utilities — Steam Ship — Distilling — Food Processing — Textile — Oil — Chemical — and many others.



**THE C. E. SQUIRES COMPANY**

Over 50 Years of Dependability

18532 SYRACUSE AVE. — DEPT. B-1 — CLEVELAND 10, OHIO



Lowering a panel onto the bundling jig. The overhead Tramrail system with interlocking crane provides direct non-stop delivery from assembling to bundling jigs.

Five Tramrail lines extending the length of the building handle completed panels from the assembly jigs to the bundling area served by the transfer crane at left. Because the crane can be interlocked with any of the lines, the loaded carriers can be run onto the crane without losing time for re-handling and quickly moved to the proper bundling jigs.

#### Case 67—Southern Chemical Plant

#### Handling 300 F Calcined Ore

A SOUTHERN chemical plant had a problem of handling hot abrasive calcined ore 24 hours per day, 7 days per week. A conventional elevator was installed to handle the hot abrasive material and at the end of one year the cost records showed that it was costing \$700 per month or \$8,400 per year to maintain the elevator.

The conventional elevator was replaced with a Beaumont "Multi-Vator" made up of "Dura-Tred" Beauclay steel chain, buckets and wheels. After three years of continuous operation, the records show that the Beaumont Birch Company installation has saved the owner \$23,000 in maintenance expenses which is more than six times its original cost.



Hot and cold rolled bars, shapes,  
flats • Structural and junior beams,  
angles, channels • Stainless •  
Rigid-Tex • Galvanized sheets,  
strip, bars and shapes

#### From Warehouse to you!

Now—from the South's newest and most modern steel warehouse—a larger-than-ever variety of ferrous and non-ferrous products is within reach of your telephone or overnight mail—ready for rapid delivery by rail or truck to any point in the Southeast.

#### METALLURGICAL SERVICE

Without cost or obligation, the services of our complete testing laboratory and metallurgists are available to help you choose correct metals, find suitable substitutes when necessary and advise on the use of stainless, alloy, high and low carbon steels.

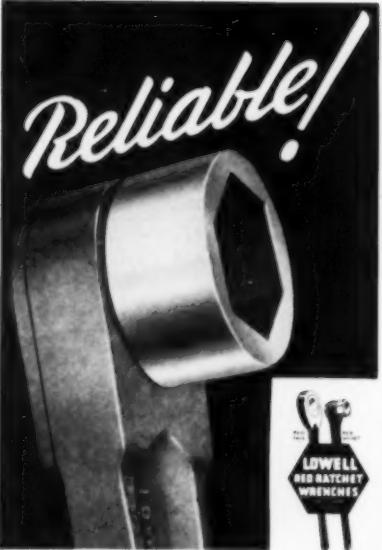
*To receive our stock lists as issued,  
drop us a line or give us a ring.*

**"Service in Step with Southern Progress"**

#### WAREHOUSE DIVISION

**Atlantic Steel Company**

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# LOWELL SOCKET WRENCH

REVERSIBLE RATCHET

Easier, Safer, Faster to Use!



**1. Snap Ring**

holds socket more securely. Removed easily with narrow screw driver or any pointed object.

**2. All Steel Cap**

instead of cast. Collar press fitted and swaged to form one-piece integral unit with larger all steel bearing for much longer wear. Cap locked into head by internal projection and screw. (Even with screw lost and cap swung 90° parts cannot fall out.)

**3. High Tensile Alloy Handle**

**4. New Tough Synthetic Finish**

**5. Enlarged Hole for Lanyard**

Order from your Distributor. Ask him for our Catalog #60A which shows the full line.

**Lowell**  
WRENCH CO.

WORCESTER, MASS.

SOUTHERN POWER AND INDUSTRY BETTER PRODUCTION . . . . .

## *Buildings and Equipment*

### Section 8

Repairs to worn metal surfaces  
. . . steel grating . . . lighting . . .  
vibration control . . . roof life  
. . . versatile conduit framing



Case 68—Tennessee Food Processing

### Exhaust Fans for Food Processing Plant

HERE are several of the twenty-four 48 in. Fresh-Air Maker exhaust fans (Schwitzer-Cummins) installed in the summer of 1952 directly over the cooking vats in a Newport, Tennessee, food processing plant. Combined air delivery of the 24 units is over 500,000 cfm. Bondurant Brothers, Knoxville, Tennessee, distributors for Schwitzer-Cummins, furnished the fans.

Installed cost approximated \$7.50 per 1000 cfm. Plant management was particularly pleased with the low installed cost when compared with returns in improved output and bettered working conditions.

## Case 69—Oklahoma

### Versatile Framing

IN this new generating station, contractors installed miles of complex and heavy conduit, cable and tubing runs with a simple nut-and-bolt construction material.



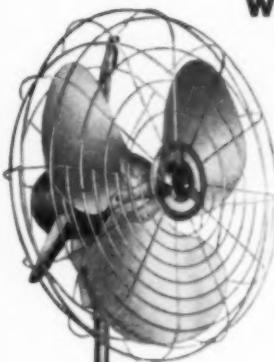
This system of electrical and mechanical supports, known as Unistrut (Unistrut Products Company), consists of steel channel and fittings, tubing, conduit and cable clamps, concrete inserts and other standard parts which can be easily assembled and erected on the job with substantial savings in engineering detailing.

Adjustments are quickly made as the work progresses, and changes readily made at any time after the work is completed. Assembly is by a unique nut and bolt method, thus eliminating the need for drilling or welding.

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N.E., Atlanta 5, Georgia. There is no obligation.

# CUT COSTS

## with EMERSON-ELECTRIC AIR CIRCULATORS



If stale, dead air handicaps your employees and drives customers away, it's costing you money.

You can cut this cost with Emerson-Electric Air Circulators. They move large volumes of air quietly . . . to keep "living conditions" inside your buildings comfortable and pleasant in all seasons. Don't let bad air add to your overhead . . . send for complete installation data today.

### EMERSON-ELECTRIC AIR CIRCULATORS

Backed by the famous 5-Year Factory-to-User Guarantee, these powerful fans are available in 24" and 30" blade sizes, with two-speed, ball-bearing capacitor-type motors lubricated for 6,000 hours' service. Your choice of floor, counter, wall or ceiling mountings. For further information see your electrical contractor or write for Bulletin No. 740.



### EMERSON-ELECTRIC EXHAUST FANS CUT COSTS, TOO!

For complete ventilation of your buildings investigate Emerson-Electric's complete line of direct- and belt-drive exhaust fans, in capacities ranging up to 19,350 c.f.m. Write for new catalog No. 740-A.

THE EMERSON ELECTRIC MFG., CO., ST. LOUIS 21, MO.

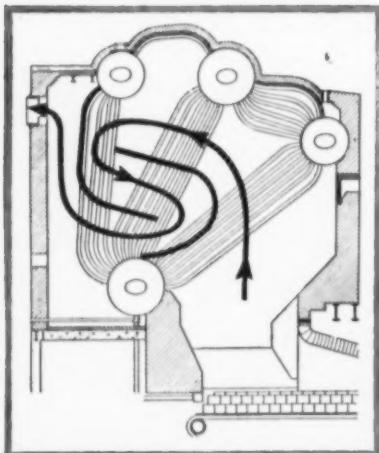
**EMERSON**  
FANS • MOTORS      **EMERSON**  
ELECTRIC  
APPLIANCES



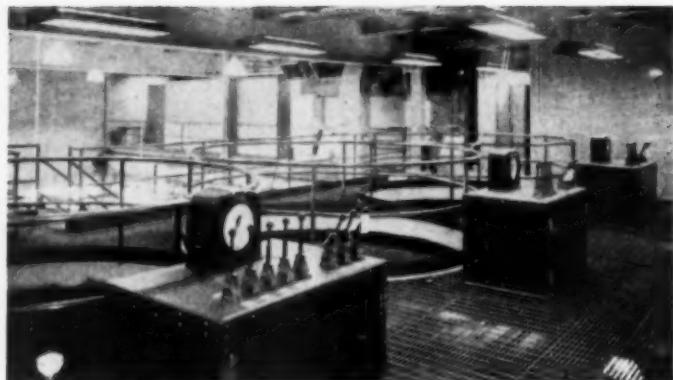
These important fuel-saving, maintenance-reducing features are obtainable with Enco boiler baffles—and only with Enco baffles.

- Streamlined gas flow
- Uniform gas flow
- Elimination of bottle necks
- Reduced draft losses
- Higher heat transfer
- Cleaner heating surfaces
- Less use of soot blower
- Special provision for expansion
- Easy tube replacement
- Adaptable to any water-tube boiler, fired by any fuel

Each application is designed on the basis of more than a quarter century of experience in this specialized branch of power engineering. Installations are made by skilled mechanics.



**THE ENGINEER CO.**  
**Enco** 75 West St.  
 New York 6, N.Y.



#### Case 70—Utility

### Modern Steel Grating Installation

A MODERN grating installation in a new steam electric station is illustrated. Weldforged steel grating (Kerrigan Iron Works, Inc.) has high strength, sheds dust and lets through maximum light and air.

Because of its continuous spiral transverse bars that rise slightly above the bearing bars (and alternate right and left) it provides excellent safety underfoot. The grating employed here is also simple to install and facilitates provision of openings and walkways.

#### Case 71—Tennessee Warehouse

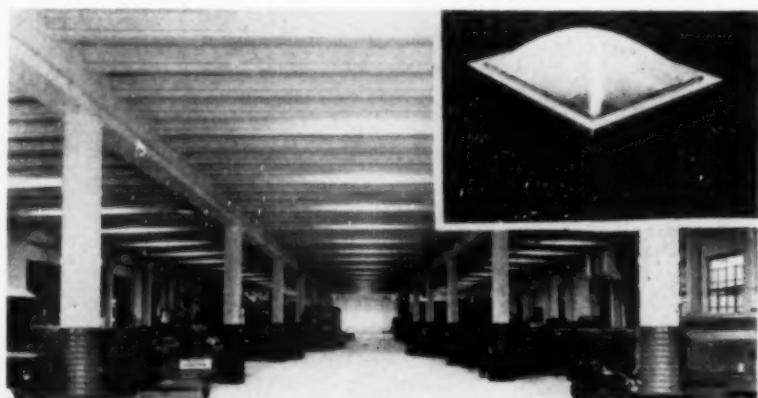
### Skydomes Light Industrial Warehouse

AN important problem was solved by Architect Charles S. Peete of Memphis, Tenn., when he used Wascole Skydomes in the Choctaw Inc. warehouse. Side wall windows and other conventional daylighting methods were impossible because of the existing taller buildings on both sides.

By installing these "windows in the roof," the architect made sure of flooding the entire working area

with glare-free overhead daylight all day long—without the need for supplementary lighting. These Skydomes furnished by Wasco Flashing Company permit maximum use of floor space (walls are free for storage area), reduce construction, power and heating cost, and provide a permanent, trouble-free overhead daylighting system.

Mr. J. M. Wood, Vice President of Choctaw Inc., reports that the

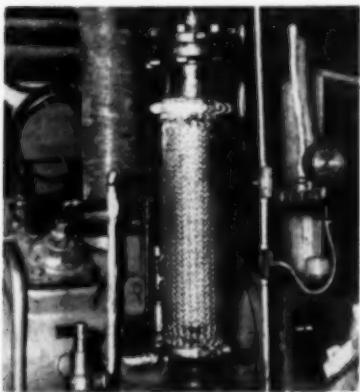


warehouse building in which Wascolite Skydomes were installed is being used to house various types of industrial equipment. And while there is no need in this building for the type of lighting demanded in a manufacturing plant, Skydomes have been highly satisfactory and furnish ample light for the purpose even on the darkest days.

#### Case 72—Tennessee

##### Vibration Control

A LARGE Tennessee tire and rubber company had the problem of eliminating air compressor vibration from the plant structure.



One unit of 8 in. I.D. Chicago Metal Hose Rex-Weld galvanized steel tubing with braided braid was installed (see illustration) in the compressor connecting line on an experimental basis.

Results have been so satisfactory that the installation of Rex-Weld units (Flexonics Corporation) are now being planned on other compressor setups.

#### Case 73—Southeast

##### Increased Roof Life With Aluminum Nails

DESIGNERS of industrial buildings for Southern plants, particularly those for coastal areas, have long recognized corrosion as a serious problem. And frequently a relatively small portion of an otherwise resistant structure proves to be the weakest link.

Such has been the case with regard to fasteners for high grade roofing and siding, where until recently use of steel nails was normal practice.

After World War II, increased use of aluminum roofing brought demand for nails of the same material—so that destructive electrolysis would be prevented.

Nichols Wire and Aluminum Company was quick to actively explore the new field and start large scale production. Nichols is still the largest producer, but others are following. With the electrolysis problem licked, asbestos shingle manufacturers soon recognized aluminum nail advantages—even

where no electrolysis problem existed. This year perhaps two out of three asbestos shingle roofs will be fastened with aluminum nails.

Aluminum nails cost about 50% more than their counterpart in steel, but long structural life and elimination of rust stains are so important that the small increase in nail cost is negligible. Now aluminum nails are offered by such leaders in the roofing and siding field as Johns-Manville, U. S. Gypsum, Flintkote and Philip Carey.

# Industrial HEAVY DUTY JIB CRANES

Precision engineered and built  
for smooth efficient operation

360° Rotation

**Industrial CRANES**

**INDUSTRIAL CRANE & HOIST CORPORATION**  
(Formerly Industrial Equipment Co.)

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**Write for Name of Nearest Agent**

# Catawissa PERFECT SEAL Unions

HOT FORGED from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

A TYPE FOR EVERY USE!  
FOR ALL PRESSURES!  
FOR ALL TEMPERATURES!



### Standard & Double Extra Heavy UNIONS

Available with  
screwed or socket  
weld ends. 3000-lb.  
sizes  $\frac{1}{8}$ " to 3";  
6000-lb. sizes  $\frac{1}{8}$ "  
to 2".



### ORIFICE UNIONS

With screwed or  
socket weld ends.  
3000-lb. and 6000-lb.  
service.

### MALE & FEMALE UNIONS

With steel-to-steel,  
bronze-to-steel, stain-  
less steel-to-steel or  
orifice seats. 3000-lb.  
service only.



### FULL STAINLESS & FULL ALLOY STEEL UNIONS

With screwed or  
socket weld ends.  
3000-lb. and 8000-lb.  
service.



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Showing the complete Catawissa line of  
Perfect Seal products

**CATAWISSA VALVE &  
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950 MILL ST. • CATAWISSA, PA.

SOUTHERN POWER  
AND INDUSTRY      BETTER PRODUCTION . . . . .

## Section 9

# Production Equipment

Vibrating screen separators . . . moisture monitor . . . electric radiant panels . . . flame-cutting method . . . initiating production orders . . . sluice hoppers . . . wirebound boxes

#### Case 74—Georgia Food Processing

### Cannery Solves Waste Control Problem

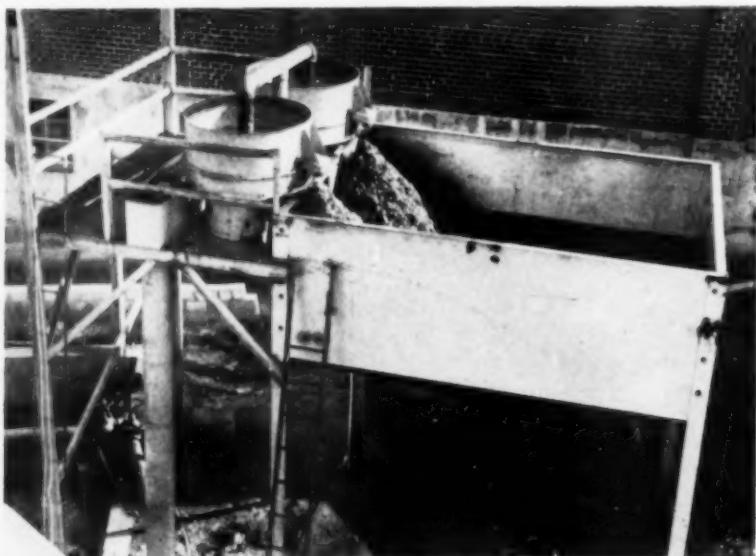
**I**N Griffin, Georgia, Pomona Products has met city and state requirements and stopped stream pollution through use of vibrating screen separators.

Two conventional rectangular screens proved unsatisfactory for cleaning waste water containing a large percentage of solids result-

ing from processing tomatoes, potatoes, pimientos, string beans and other vegetables. Blinding occurred on the 40-mesh screens and plus 40 waste built up and overflowed the screen ends, contaminating the stream and killing fish.

Using two 48 ft diameter Sweco Vibrating Screen Separators with

Sweco separator installation at Pomona Products, Griffin, Ga. Dewatered vegetable waste feeds directly from Sweco to waiting bin. Trucks remove dry waste through trap-door at regular intervals.



oversize table discharge spouts furnished by Southwestern Engineering Co. of Los Angeles, Calif., Pomona now successfully screens 900 gallons of waste water per minute.

Waste from pimiento, string beans and other vegetable canning is passed through 150-mesh stainless steel wire cloth and 40-mesh screen is used for dewatering full volume peach waste water. Waste water from Irish potato processing contains 2% solids. Best feeding procedure is to lower the 6 ft input pipe through which discharge waste water is pumped to screens to a point immediately above and very close to the center of the screen.

The vibrating screen performance has satisfied both city and state officials, and the operation is so successful that the final installation will include four Sweco screening units.

#### Case 75—North Carolina

#### Moisture Monitor Speeds Processing

THE Moisture Monitor, now a widely accepted instrument for indicating moisture condition of textile warps and fabrics in production, was first installed over a year ago on sixteen slashers in the White Oak Plant of Cone Mills, Greensboro, N. C. What was needed, according to the mill management, was a reasonably priced indicating instrument which would guide a slasher operator by showing, simply and clearly, whether the warp coming from the dry cans was too wet, too dry, or just right. Charles Strandberg was called in to help develop such an instrument.

In developing the instrument, Strandberg Engineering Laboratories, who are now manufacturing the instruments on a commercial scale in Greensboro, N. C., eliminated many of the objections to industrial electronic equipment, and the monitor is proving its worth in other plants.

Users of the new development find that steam consumption for drying purposes can be substan-

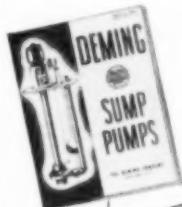


#### (DEMING PUMP SPEAKING)

"I work in a knitting mill. My job is to recirculate a corrosive liquid bleach through a tank with heating coils. The hot solution is then sprayed into vats which hold about 3000 lbs. of unbleached cloth. I pump for about 9 hours at a stretch. Then I rest for about 1½ hours while they unload the bleached cloth from the vats. Then I start pumping on my next 9 hours' stretch."

"I've been on this job for 1½ years with no layoff due to me. My boss hasn't spent a nickel for repairs or maintenance on my account. He says that the pumps I replaced on this job cost him plenty in upkeep. They were run by V-belts which would rot out and the pump bearings would corrode and freeze. Other troubles included the loss of many a batch of ruined cloth. So he tells me I cured a lot of headaches and reduced a lot of costs."

(The Deming Pump speaking is a standard Fig. 4612 with regular drip proof motor. Full details on request.)

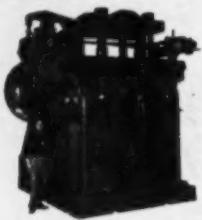


#### Send for BULLETIN NO. 4600-A

This illustrated bulletin gives you plenty of facts on the latest models of Deming Sump Pumps.

THE DEMING COMPANY  
549 Broadway • Salem, Ohio, U. S. A.

Specify **DEMING PUMPS**



## "NO SHUT-DOWNS WITH LUBRIPLATE"

—say HENRY & WRIGHT  
of Hartford, Conn.

"While waiting for delivery of one of our 25-ton Dieing Machines to do a particularly heavy job, a customer was trying to start production of a 10-ton machine. Even though it was lubricated with a conventional grease every eight minutes, the machine had to be shut down for bearings to cool during each coil run. Then, on our recommendation, he changed to a LUBRIPLATE Lubricant. With but two applications of LUBRIPLATE a day, the machine operated continuously except during change of coils."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N.J. or Toledo 5, Ohio.

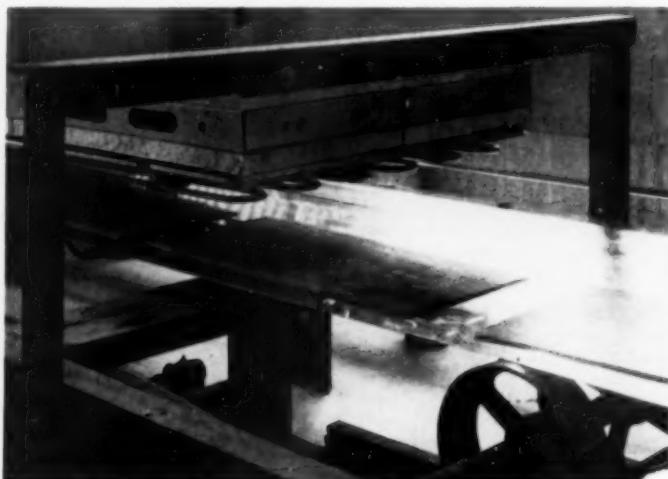
**REGARDLESS OF THE SIZE  
AND TYPE OF YOUR MACHINERY, LUBRIPLATE  
LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.**



tially reduced and machine speeds increased. This means that work previously done in three shifts can now be accomplished in two shifts in some mills.

The developers also believe the

new instruments may be useful in many other operations in wet processing, to indicate not only moisture content, but the degree of caustic or acid concentration in materials being processed.



Chromalox Radiant Panel installation heats asphalt tile for recutting.

### Case 76—Southwest

## Electric Radiant Panels Improve Asphalt Tile Processing Operation

A SOUTHWESTERN manufacturer had the problem of providing evenly distributed controllable, high intensity infrared radiation for raising temperature of asphalt tile from ambient to 135 F preparatory to going to re-cutting press. The former heat source lacked in intensity, could not be controlled, required too much space, required an excessively long heating time of 44 seconds and constituted a perpetual and irritating maintenance problem due to breakage.

### New Installation

A quantity of eight RP-410 Chromalox electric radiant panels (Edwin L. Wiegand Company) rated at 10.8 kw each were installed on simple framework over the 2 ft wide belt and were connected through a VCA input controller and contactor. The heaters are interlocked with the conveyor

so that they can only be turned on when the belt is moving. Heating elements are approximately 4 in. above the belt. At full intensity tile is heated in 7 seconds. When full capacity is not desired the input controller is set down as low as 50% of full capacity and the belt slowed down proportionally.

### Advantages

- Former heating time of 44 seconds reduced to 7 seconds, a saving of 5/6 of the original time required.
- Low cost of construction—cost of radiant panels to user \$18.70 per kw.
- Tunnel length reduced from 25 to 16 ft—a saving of 36% of floor space.
- Conveyor speed increased from 34 to 137 fpm—4 times the old conveyor capacity is now available.
- Installation is entirely con-

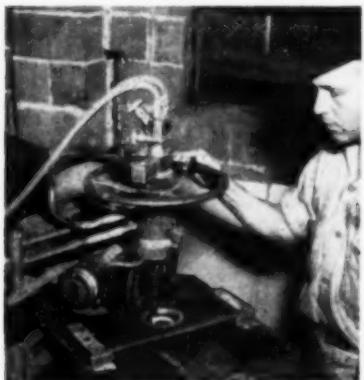
trollable; actual input and electrical demand are reduced to only that required to do the work being processed.

6. Tile is uniformly heated—no hot spots or overlapping circles of heat.

#### Case 77—Georgia

#### Flame-Cutting Cuts Costs

**H**EAVY stamping and punching machinery has been eliminated in the manufacture of farm cultivators by D. W. Waldron Company of Valdosta, Georgia. An oxy-acetylene blowpipe mounted on an "Oxweld" CM-16 cutting machine cuts all holes from  $3\frac{1}{2}$  in. diameter down to  $\frac{3}{4}$  in. diameter.



The drive wheel of this "Oxweld" CM-16 cutting machine rotates cutting table and workpiece beneath the blowpipe. Standard stops on the underside of jig plates center parts on the cutting table.

Exact repetition in quantity production is assured by interchangeable drive plates which guide the cutting machine, and jig plates which hold the parts in position. Change-over is so rapid that the blowpipe can be left burning between cuts without waste.

The distance between the cutting blowpipe and the center of the rotating cutting table determines the diameter of the circle to be cut. This distance can be increased or decreased easily by sliding the double U bracket, shown at left in the illustration, along the twin horizontal pipes. Irregular shapes are so designed that they can be cut on a heavy shear.

## Automatic sight feed lubricator for pressure service



**ELLIOTT**  
pressure type  
**LUBRICATOR**

● On-and-off control is entirely automatic—when pressure is on, lubrication starts. When pressure is shut off, lubrication stops. No valve to operate—or to forget. When operating the oil flow remains constant, and is accurately regulated by a knurled cap. Knurled filler plug is easily made tight by hand. No tools needed. Here is ideal lubrication for tube cleaners, soot blowers, or other steam or air-driven equipment. Details sent on request.

## Trigger-controlled cleaner for small straight tubes

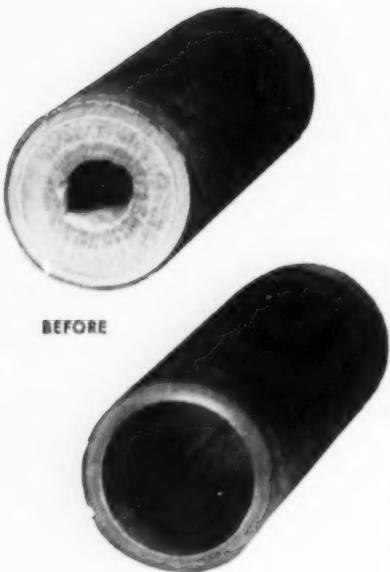


● This is the tried and proven Lagonda suspension type cleaner, redesigned for increased power and instant control. Two ball-type bearings, handling thrust both ways, let all the power through to the drill or cutter. Controlling trigger located at the base of the handle gives instant regulation from wide open to shut-off. It controls water supply as well as pressure. The air or steam-driven cleaner is illustrated. Also available with electric motor drive, with similar convenient control. Bulletin sent on request.

**LAGONDA**  
suspension type  
**CLEANER**



**ELLIOTT COMPANY**  
LAGONDA DIVISION • SPRINGFIELD, OHIO  
Plants at Jeannette, Pa., Ridgway, Pa., Amherst, N. J., Springfield, O., Newark, N. J.  
DISTRICT OFFICES IN PRINCIPAL CITIES



AFTER descaling with  
Oakite Compound No. 32

**DON'T ROD OUT SCALE**

## —Dissolve It!

**OAKITE COMPOUND No. 32** did all the work on this pipe—did it better, faster, far more safely than any mechanical method.

Oakite Compound No. 32 *dissolves* scale and rust as it circulates—often makes dismantling of equipment unnecessary. Removes *all* deposits—flows into areas inaccessible to rod and drill. Does not affect sound metal surfaces—does not change dimensions of tubes and piping.

Use Oakite Compound No. 32 to descale and derust

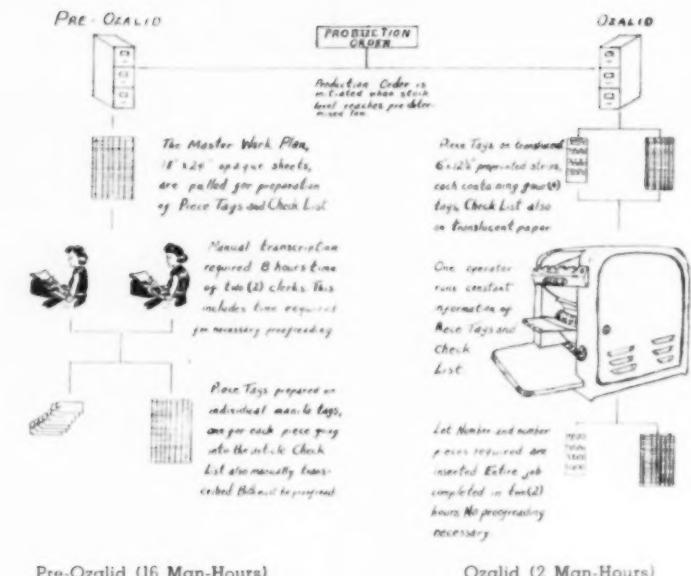
condensers  
compressors

heaters  
brine coolers

**FREE HANDBOOK 4305** tells all about it. Ask your local Oakite Technical Service Representative. Or write Oakite Products, Inc., 20A Rector St., New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING  
**OAKITE**  
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in  
Principal Cities of United States and Canada



Pre-Ozalid (16 Man-Hours)

Ozalid (2 Man-Hours)

The new Ozalid system offered the following advantages: Reduction of 87.5% of the time required to get order into production; reduction of personnel that were required by manual transcription; increase in overall efficiency of system; elimination of error hazard present in manual transcriptions; and increased flexibility when minor changes in design of articles are made.

### Case 78—North Carolina Furniture

#### Initiating Piece Tag Production Orders

FURNITURE, as are most "custom-built" predesigned items, is composed of many parts of a definite size, shape and texture. These parts must be fabricated with exacting precision, cut from the most economical size raw stock, and assembled in sequence of need for construction of the finished product. Most furniture manufacturers have a definite number of styles in their line. Designs and specifications are maintained for each of these styles and production initiated when stock level is reduced to a predetermined low.

#### Former System

The Bernhardt Furniture Company, Lenoir, North Carolina, used to maintain a Master Work Plan (often called Bill Sheet) for each item in their line. This plan consisted of opaque sheets 18" x 24" on which was a list of all parts going into the item. When a production order was initiated for a run of a particular item, it was necessary for two (2) clerks to pull this Master Work Plan and manually trans-

cribe onto manila tags each part name, complete description, quantity required to fabricate the number of units ordered, and the Lot number. There is an average of 70 pieces required to make an item of furniture; therefore, it was necessary for the clerks to transcribe onto 70 manila tags the above information.

Also, manually transcribed from the Master Work Plan was a check sheet, which is merely a consolidation of all materials required to produce the ordered item, so the plant superintendent can be sure that all components of the item are prepared prior to the scheduled production date. These manual transcriptions required the services of two clerks for a period of 8 hours each time production of an item was ordered.

Even with the necessary proofreading, danger of loss of valuable materials and production was ever present, due to the required transcriptions.

Mr. C. W. Clarke, office manager of Bernhardt Furniture Company,

in an effort to reduce costs and increase efficiency of the office procedures, invited Mr. B. S. Cassels of Duncan Printmakers, Charlotte, North Carolina, to explore the Ozabilities of this Piece Tag (often called Cutting Tags) System. He immediately saw an excellent potential for Ozalid to eliminate this bottleneck in production of furniture and, also, other products manufactured in a similar manner.

The first step was to transfer all Master Work Plans for each item from the 18" x 24" opaque sheets to preprinted translucent strips 6" x 12½", four parts to the strip. Next, Ozalid sensitized card stock was processed by a tag manufacturer, perforated into strips of four each, with reinforced eyelets on each tag. The reinforcing of eyelets on the tags can be an optional feature, depending on how much pressure is placed on the eyelet.

Then the Check List was transferred to an 8½" x 14" translucent sheet. The Master Work Plan sheets and the Check List are filed by stock number of the respective items. When a production order is initiated, one clerk pulls these translucent masters from the files and in a matter of minutes prepares the Piece Tags and the Check List. After completion of the Piece Tags on the Ozamatic, it is a simple matter to insert with a numbering machine the lot number and pencil in the number of pieces required for the quantity of the item ordered.

The foregoing system will be of the best advantage to case goods manufacturers (all wood construction) rather than upholstered items. Upholstered items do not usually have enough cutting pieces to require the Tag System.

#### Case 79—Louisiana

#### **Stapler Speeds Mop Production**

THE Consolidated Manufacturing Company of New Orleans, Louisiana, manufacturer of mops, uses a Bostitch motor-driven stapler to tack on the wooden wringer grip to a mop handle. Three staples are placed through the round wooden grip on each mop to fasten

## **IF YOU USE STEAM FOR HEATING — COOKING OR PROCESSING —**

# *You can get POWER at almost no cost!*

Wing Steam Turbines cost little or nothing to operate where their oil-free exhaust steam can be used in process operations—or in space heating. The Turbine acts as a reducing valve... its exhaust steam has been reduced to the pressures used in heating and cooking operations. Wing Steam Turbines give an infinite range of speeds, easily controlled by throttling—and they are completely independent of any electric power failure.

## **WING STEAM TURBINES**



Wing Turbines furnish smooth, dependable power for compressors, pumps, fans, blowers, winches, generators, mixers and similar equipment.

#### **OPERATING RANGES**

Horsepowers to  
150 b.h.p.

Temperatures to 750°F.  
Pressures to 600 p.s.i.  
Back Pressures to 50 lb.  
Speeds to 4000 r.p.m.

Wing Steam Turbines are known for their rugged construction, trouble-free operation, long life. They have been serving industry for over a half-century. Write us for further information. Ask for Bulletin SW-1a.

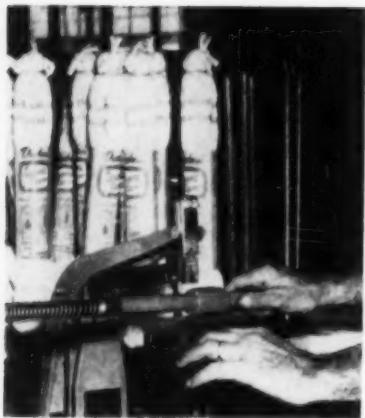
## **L. J. Wing Mfg. Co.**

169 Vreeland Mills Rd.  
Linden, N. J.

Factories: Linden, N. J. and Montreal, Can.

# **Wing**





Since switching to a motor-driven Bostitch stapler, one man now does in one hour as much work as it formerly took seven men to do in the same period of time. Stapling is seven times faster.

it securely to the handle. The former method of applying these grips was with hammer and nails.

Consolidated reports that the stapling is much more convenient and safer as the men cannot hit their hands. These people believe that their product is more saleable

because of the neater appearance of the staples. In addition, there is little likelihood of splitting the wood as was the case when nails were used.

#### Case 80—Paper Mills

### Sluice Hoppers Improve Operation

SEVERAL recently constructed paper mills located in the Southern and Southwestern sections of the country are using Koppers electrostatic precipitators, equipped with sluice hoppers to recover sodium sulphate and sodium carbonate from Kraft process recovery boiler stack gases.

Ash deposited on the precipitator collecting plates is removed by pneumatic rapping devices and falls onto a dry floor area below. A slow-moving scraper mechanism drags the collected ash along the floor and deposits it in a sluice hopper located at

the precipitator inlet. Spent black liquor in quantities ranging from 40 to 150 gpm (this quantity not critical) flows into the sluice hopper and flushes out collected ash.

The sluice hopper design is a relatively new development of Koppers Company, Inc., Metal Products Division (Baltimore, Maryland). The original design called for a screw conveyor located in the dust collecting hopper.

### Advantages

Excessive screw conveyor and rotary valve maintenance costs (resulting from plugging, bridging and solidification of the ash), plus transportation problems created when moving the dry ash to the mixing tank, led to the development of the sluice hopper. This sluice hopper is incorporated right in the weak liquor piping circuit. Results—elimination of the need for a screw conveyor and, therefore, elimination of such maintenance costs. Furthermore, the



Sweeping stirs up dust and moves it to a new location; air hose cleaning is both costly and dangerous. Vacuum cleaning removes plant dust safely, rapidly and economically.

Hoffman Vacuum Cleaning Equipment is available in permanently piped stationary systems or in four sizes of portable units. Hoffman dust

removal systems may be used to remove all types of plant dust, to empty low pressure dust collectors or for many other material removal applications.

**Write for a free brochure on dust and its removal.**  
*Hoffman also builds a complete line of blowers and exhausters for industrial use.*

AIR APPLIANCE  
DIVISION



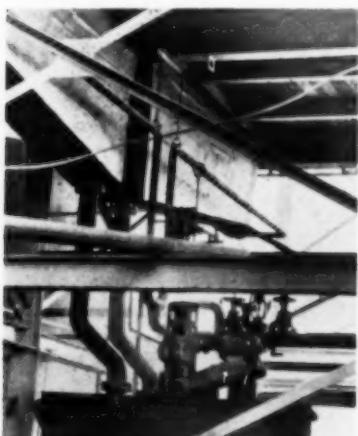
U. S. HOFFMAN MACHINERY CORP.  
92 East 12th St.  
New York 3, N. Y.

# Hoffman

liquor flushing through the sluice hopper tends to partly mix and dissolve the ash before it reaches the mixing tank.

The plan area of the sluice hopper is small compared to the total floor area at the bottom of the precipitator. This is in marked contrast to the so-called wet bottom type precipitator which has a completely flooded floor area. Since there is a tendency for moist vapors to rise from the exposed liquor surface, the sluice hopper type unit is much less subject to operating and maintenance problems resulting from the widespread dispersion of these vapors. Results—substantially longer life for those parts of the collecting plates and discharge electrodes located immediately above the bottom of the precipitator, a desirable feature which is lost in wet bottom type precipitators having totally flooded precipitator floors. Also, the leakage problem with the small type sluice hopper is practically nil when compared to a totally flooded precipitator floor.

Tests on this sluice hopper show that the liquor flush will adequately dispose of unusually heavy loads with no difficulty; also, if the liquor supply is temporarily turned off, the readmission of the flush liquor will remove the accumulation without difficulty. All mills that are using this improved method report satisfactory performance.



This view of the underside of a Koppers precipitator shows sluice hoppers for a double chamber unit. Note 2 in. weak liquor feed lines and 6 in. drain lines emptying into mixing tank conveniently located under precipitator.

**KEEP IT MOVING-**

**WITH**

# Fairbanks<sup>®</sup> HAND TRUCKS

**The best trucks made  
for your materials  
handling job**



**THEY'RE TOUGH:** steel framed wood chassis  
for strength and shock absorption.

**THEY'RE SMOOTH:** available with any type of wheel—Semi-Steel to Vulcanized Rubber Tired, with roller bearings and pressure lubrication—for easy rolling everywhere.

**THEY'RE BALANCED:** a COMPLETE line providing the right style for your particular material handling requirements.



Series 21 LOCK-WELD Swivel Casters  
eliminate the greatest cause of caster  
failure: the king pin.



Fairbanks Steel  
Framed Platform Trucks take  
the LOAD off your mind.

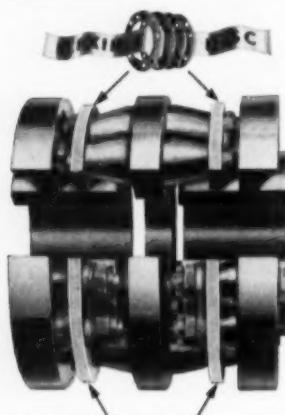
Write for your copy of Fairbanks SFT Bulletin  
for further details on steel framed hand trucks

THE **Fairbanks** COMPANY  
393 LAFAYETTE STREET • NEW YORK 3, N.Y.  
Branches: New York 3 • Pittsburgh 22 • Boston 10 • Rome, Ga.

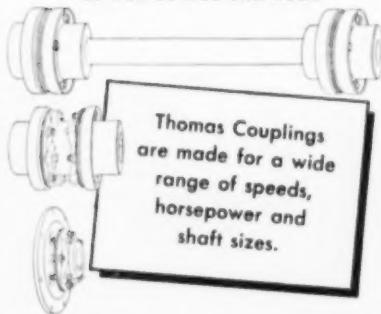
**VALVES • DART & PIC UNIONS • TRUCKS • CASTERS**

**Specify THOMAS** ALL METAL  
**FLEXIBLE COUPLINGS**  
 for Power Transmission to  
 avoid Costly Shut-Downs

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.

THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
CONDITIONS OF MISALIGNMENT

NO MAINTENANCE PROBLEMS

ALL PARTS ARE  
SOLIDLY BOLTED TOGETHER

Write for our new  
Engineering Catalog No. 51

**THOMAS FLEXIBLE COUPLING CO.**  
WARREN, PENNSYLVANIA, U.S.A.

Case 81—Kentucky

**Improved Packing Methods With Prefabricated Wirebound Boxes**

PACKING for export was a problem at Tube Turns, Inc., in Louisville, Ky., until recent years—but no more.

The company manufactures seamless welded fittings for piping in over 4,000 different types, sizes, metals, and alloys. They are shipped all over the world for use in hundreds of different industries under every conceivable climatic condition.

Tube Turns, Inc., formerly made all its own export shipping containers from heavy lumber bought on the open market and then cut to size and nailed together to fit individual shipments. This, of course, meant lack of standardization in containers, excessive tare weights and displacements, the costly nuisance and waste of making containers, and not infrequent shipping damage due to container failure.

**Standardization**

The problem was solved by making a complete survey of Tube Turns, Inc., export shipments and

packing. As a result of the survey, the company adopted just three sizes of prefabricated wirebound boxes. Those boxes now are used for packing a preponderance of Tube Turns, Inc., products for export.

Robert J. Tyler, general traffic manager, reports that the wirebound boxes, when compared to containers that the company made from one-inch lumber, have reduced shipping tare weights by two-thirds, displacement by 25%, and over-all packing - for - export costs by 70%.

The standardization of containers also has resulted in faster and more economical handling of packed containers, more profitable use of the factory space and labor formerly devoted to making containers, more economical use of warehouse and storage facilities because the standard sizes of wirebound containers can be safely high-stacked according to predetermined patterns, and economy of space in storing containers before use.

Twelve-inch elbows are among the largest welded seamless pipe fittings packed in wirebound boxes by Tube Turns, Inc., for export shipment. Three such elbows, weighing 62 lb each, are packed (left) in a prefabricated wirebound box that weighs only 35 lb. Excelsior assures a firm, tight pack.

Smaller sizes of seamless welded fittings, such as these 4 in. elbows (right) are packed end-to-end in zig-zag pattern in layers. Package will have a shipping weight of 460 lb, including only 46 lb, or 10%, of tare weight. Company sprays their prefabricated wirebound export containers with brilliant red paint for easier identification.



### Small Factory Gets Big Plant Production

A North Carolina agricultural machinery manufacturer has built a \$990,000 annual addition to its business, within four years, on a new hay baler, with very small additional investment for special dies, and without any additional investment for machine tools, plant, or patterns. Present sales—6,000 units estimated in 1953—are double those of 1952.

The manufacturer developed an improved hay baler design in 1949. Four pilot models were built by hand, at considerable cost, and a study was made of the plant and equipment required to put the hay baler into commercial production. Estimated cost of major machinery, exclusive of dies, jigs, fixtures etc., was \$1.15 millions.

To save this capital investment, the manufacturer placed orders with By-Products Steel Company, a division of Lukens Steel, for the component parts required, and determined to keep his part of the production to the assembly of pre-fabricated, close-tolerance parts. The total investment required on his part was less than 4% of what he would have needed for machinery if he had handled the whole operation—without counting the additional investment needed for buildings, trained personnel, increased overhead, and similar items.

By-Products Steel Co. worked directly from the designers' blueprints, saving the additional expense and delay of making patterns.

Using these king-size facilities, manufacturers save in many ways. They start one step ahead, and that much nearer the finished job. Close tolerances save fit-up time and free the assembler's machinery for other work. Freight is paid only on the weight of the actual part—not on scrap metal, and a saving is made on scrap loss and handling, since there is no scrap to bother about. Scrap credit is given at the mill, where the value is highest.



### Ask Your Distributor

It's astonishing how much there is to selecting the right gaskets for even a modest range of services and service conditions. That doesn't mean that to get maximum efficiency and economy from your various seals you have to become an expert yourself. Fortunately for this time of accelerated activity and pressing responsibilities, you can solve this problem once and for all by making a simple telephone call to your BELMONT gasket distributor. He has the knowledge and the precise materials to assure you of reduced maintenance and uninterrupted production wherever joint and surface sealing is critical.

Ask a BELMONT distributor . . . he knows!

Or, write on  
your company  
letterhead for  
catalog

404



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FOR STEAM • WATER • OIL • GAS  
AIR • ACIDS • ALKALIES • AMMONIA

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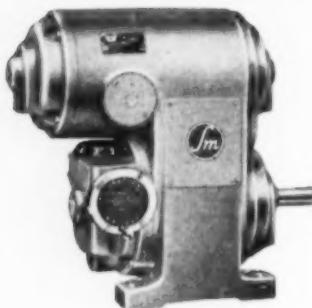
BELMONT ENGINEERING COMPANY  
PHILADELPHIA 37, PA.  
U.S.A.

RINGS • SPRAINS • COILS • BELLS  
SPRINGS • SHEETS • GASKETS

# How One Speed-Trol Leads to Another

*Mr. J. H. Kirby, Vice President of The Humko Co., writes: In processing vegetable oil and shortening we must drive our batch mixers at various speeds . . . a Speed-Trol was installed for this purpose . . . we were so well pleased with its performance that we installed Speed-Trols on ALL of our vegetable oil batch mixers . . . Speed-Trols give the exact speed regulation needed for vegetable oil processing.*

## STERLING SPEED-TROL



### GIVES YOU VARIABLE SPEED CONTROL NECESSARY FOR:

**Equipment adaptation to:** Sequence synchronization — operators' abilities — load variations due to differences in quantity, quality, weight, size, tension, hardness or shape of material to be processed, machined, conveyed, blended, mixed, etc.

**Process control of:** Temperature — viscosity — level — pressure — flow — etc.

**Time control of:** Baking — drying — heating — cooking — pasteurizing — soaking — chemical action — etc.

With Speed-Trol you get the maximum in production, plant efficiency, quality & profit.

**20-page illustrated catalog...**  
Sterling Speed-Trol, Slo-Speed, Klosd and Klosd-Tite Electric Power Drives. Write for catalog No. A-430.

**STERLING**  
ELECTRIC MOTORS

Plants: New York City 51; Van Wert, Ohio; Los Angeles 22; Hamilton, Canada; Santiago, Chile  
Offices and distributors in all principal cities

# NEWS for the South

## Oakite—Beaumont, Texas

L. W. (LARRY) CUNNINGHAM, for the past six years technical service representative in the SHREVEPORT area of OAKITE PRODUCTS, INC., manufacturers of specialized cleaning and allied materials, has been appointed to the company's new BEAUMONT field territory embracing Southeastern Texas, Central and Southwestern Louisiana.



L. W. (Larry) Cunningham

A member of the company's field service organization since 1947, Cunningham assumes his new post after extensive experience in industrial cleaning procedures, his work keeping him in particularly close contact with petroleum refineries where he has been instrumental in setting up new cleaning methods that have contributed to faster turnaround of processing equipment. His address is 3260 Redwood Drive in Beaumont, where he will be available for technical advisory service in connection with cleaning and related operations.

## Lynch and Whatley—Va.

JOHN P. LYNCH and WILLIAM J. WHATLEY, both of whom were formerly associated with the Wyatt C. Hedrick organization, announce the formation of a consulting engineering firm, known as LYNCH & WHATLEY. Address of the new firm is P. O. Box 8865, RICHMOND 25, VIRGINIA. A brochure is available describing the electrical, mechanical, and structural engineering services offered.

## FUTURE EVENTS

### Of Engineering Interest

**INTERNATIONAL MACHINE TOOL EXPOSITION**, Carl Friedan, Central Feature News, Times Tower, 1675 Broadway, New York 36, N. Y.  
Oct. 5, First Exposition, Demonstration Hall, 132 54th St., Brooklyn, N. Y.

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS**, C. E. Davies, Sec'y, 29 West 39th St., New York, N. Y.  
Oct. 5-7, Fall Meeting, Hotel Sheraton, Rochester, N. Y.  
Nov. 29-Dec. 4, Annual Meeting, Statler Hotel, New York, N. Y.

**PETROLEUM ELECTRIC POWER ASSOCIATION**, Fred B. Clark, Chm. Publicity Comm., Arkansas Power & Light Co., El Dorado, Ark.  
Oct. 5-7, Silver Anniversary Meeting, Muehlebach Hotel, Kansas City, Mo.

**NATIONAL ASSOCIATION OF CORROSION ENGINEERS**, A. B. Campbell, Exec. Sec'y, 1081 M&M Bldg., Houston 2, Texas  
Oct. 7-9, South Central Region Meeting, Mayo Hotel, Tulsa, Okla.  
Nov. 12, Southeast Region, Fall Meeting, Birmingham, Ala.  
March 15-19, 1954, Tenth Annual Conference & Exhibition and Refinery Industry Symposium, Kansas City, Mo.

**AMERICAN WELDING SOCIETY**, J. G. McGrath, Exec. Sec'y, 29 West 39th St., New York 18, N. Y.  
Oct. 19-21, Annual Meeting, Cleveland, Ohio.

**AMERICAN SOCIETY FOR METALS**, W. H. Eisenman, Sec'y, 7301 Euclid Ave., Cleveland 3, Ohio.  
Oct. 19-23, Annual Meeting, Cleveland, Ohio.

**EXPOSITION OF CHEMICAL INDUSTRIES**, Charles F. Roth, Mgr., International Exposition Co., 480 Lexington Ave., New York 17, N. Y.  
Nov. 30-Dec. 5, 24th Exposition, Commercial Museum & Convention Hall, Philadelphia, Pa.

**PLANT MAINTENANCE & ENGINEERING SHOW**, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.  
Jan. 23-24, 1954, Exposition, International Amphitheatre, Chicago, Ill.; and Plant Maintenance & Engineering Conference, Hotel Conrad Hilton, Chicago, Ill.

## Reliance Mobile Exhibits

Two unusual mobile exhibits are being sponsored by the RELIANCE ELECTRIC AND ENGINEERING COMPANY, of Cleveland, Ohio.

Both of these industry-touring units have been designed and fitted out to facilitate on-the-spot demonstrations and discussions of production applications involving electric motors, power drives and their related controls with factory and mill management and maintenance men, production managers, plant superintendents, electrical engineers and purchasing agents.

## **Oliver United Filters Names Reeves—N. C.**

Continuing a policy of establishing competent filtration engineers in active general industrial areas, OLIVER UNITED FILTERS, INC., is locating THOMAS C. REEVES in ASHEVILLE, N. C., to serve the chemical and general industrial fields in the southeastern part of the country. Mr. Reeves has been with the Eastern Division for many years as sales engineer, specializing in the heavy chemical and general industrial fields requiring filtration and clarification.

## **SKF Industries—Charlotte**

SKF INDUSTRIES, INC., Philadelphia ball and roller bearing manufacturers, have announced the opening of a new district office and warehouse at 2935 South Griffith St., CHARLOTTE 3, NORTH CAROLINA, with DAVID B. EDEN, Jr., as district manager.

The new warehouse will carry larger stocks of anti-friction bearings to better serve industrial users in North and South Carolina, and parts of Georgia, Tennessee and Virginia.

## **Nelson Stud Welding Branch—Atlanta**

NELSON STUD WELDING DIVISION OF GREGORY INDUSTRIES, INC., has established a new direct Factory Branch Warehouse at 696 Whitehall Street, ATLANTA, GEORGIA, to meet increased demand in Alabama, Georgia and South Carolina.

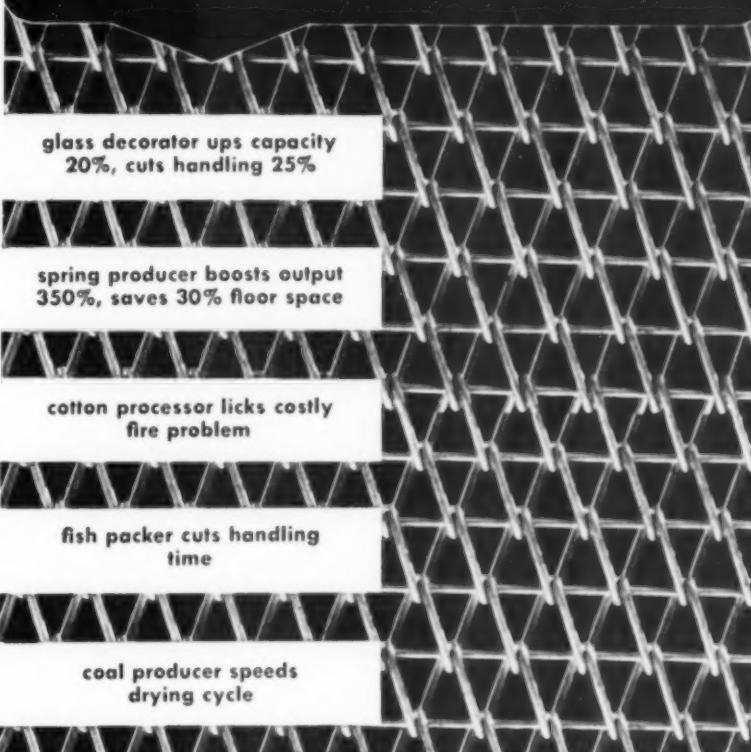
HERBERT W. SCOTT, JR., Nelson's southeastern district manager, is in charge of the branch which will stock studs, parts and accessories and will have Nelson stud welding guns, Nel-welder generators and battery units available for purchase or rental.

Scott served as a field engineer for the organization in New York and St. Louis territories prior to his transfer to Atlanta earlier this year.

FRED MILLENBAUGH, who has been named field engineer for the states of Georgia and South Carolina, will make his headquarters at this new Atlanta branch warehouse. Millenbaugh has been with the company since 1944, serving as head of the Customer Service Department at the company's headquarters in Lorain, Ohio, for the past seven years.

Sales of the Remington stud driver and studs, distributed nationally by the Nelson organization, will be handled by HILLMAN MCWORTER in this territory.

## **RESULT STORIES THAT RING THE BELL!**



## **Cambridge Wire Mesh Conveyor Belts**

have helped produce these cost-saving results in plant after plant across the nation.

Wouldn't it be a good idea for you to investigate how these amazingly versatile conveyor belts can combine movement with processing in the equipment you are building?

They can be used at temperatures ranging from sub-freezing for food packers, to as high as 2100° F. for heat treating. They can be used in corrosive solutions such as pickling acids or in ordinary water if your product must be washed during processing. Open mesh of the belt allows free circulation of process atmospheres, free drainage of process solutions. All-metal construction means long life and low maintenance. They're available in any metal or alloy, mesh or weave, length or width.

**Best of all, Cambridge has a solidly experienced Field Engineering staff at your service. Look under "Belting-Mechanical" in your classified telephone book for the man nearest you. Call him in at any time.**

**Incidentally, we'll be glad to send you details on any of the result stories described in the heading of this advertisement.**

**FREE, FOR YOUR OWN STUDY**  
—NEW, 140 page Cambridge Belt Catalog illustrates and describes wire mesh belt specifications, gives conveyor design sketches and metallurgical data. It's must-reading for economy minded designers! Write for yours!



## **The Cambridge Wire Cloth Co.**



WIRE  
CLOTH

METAL  
CONVEYOR  
BELTS

SPECIAL  
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FABRICATIONS

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# MARTINDALE

## MODEL 52 V.A.O. TESTER



This new, sturdy, portable instrument has 5" meter—Four testing ranges: Volts, AC and DC; 0-10, 0.50-0.250, 0-1000, AC only; 0-2.5; Amperes, DC only; 0-10; Ohms; 0-1000, 0-10000; Megohms; 0-1, 0-100. Selector Switch provides four positions: Volts AC, Volts DC, Ohms, Amps. Range Switch has 5 positions which provide for above Voltage ranges, 1 ohm ranges, and 1 ampere range. 4' test lead has both prods and alligator clips. Has sturdy, leather carrying case.

## GROWLERS



This Universal Adjustable Growler may be used as both an external Growler for armatures and an internal Growler for stators. It will test armatures from 2" diameter up, and stators from 5½" diameter up. Available with or without meter. Six other models.

## BENCH-TYPE UNDERCUTTER



Model HV-3 is a precision built, rugged, fast and accurate undercutter with a wider range of armature sizes and shaft lengths than any similar machine being built.

Write for New 64-page Catalog No. 29 describing these and many other products for Industrial Maintenance, Safety and Production.

## MARTINDALE ELECTRIC CO.

1334 Hird Ave. Cleveland 7, Ohio

## news for the South and Southwest (continued)

### Fluor Corp.—Houston

The appointment of J. W. ELIZARDI, JR., as Vice President in charge of Mid-Continent Area Sales for THE FLUOR CORPORATION, LTD., of Los Angeles, has been announced.



J. W. Elizardi, Jr.

Mr. Elizardi, whose headquarters will be in HOUSTON, TEXAS, was formerly Gulf Coast manager for The Marley Company. Before this he served for many years as Vice President in charge of Petroleum sales for The Griscom-Russell Company in Dallas and Houston. He is a graduate of Tulane University.

### Thomas & Betts—S. E.

New sales appointments announced recently for the THOMAS & BETTS Co. include BILLY R. CONNOR, who replaces Hugh Holcombe in covering the North Carolina area. He reports to Fred Shepard, Atlanta district manager.

SAMUEL S. JETT, JR., was assigned to cover the Virginia area except for Danville and Fairfax Counties. Connor serves Danville County and Edward L. Osborne, Baltimore-Washington sales representative, covers Fairfax County.

### Carbide & Carbon—Texas

Construction is well under way at the site of a new plant near SEADRIFF, TEXAS, it was announced by CARBIDE AND CARBON CHEMICALS COMPANY, a Division of Union Carbide and Carbon Corporation. Completion of the multi-million dollar plant is expected in about a year. The Seadrift plant is a part of Union Carbide's expansion program for the increased production of ethylene oxide and polyethylene.

### C. I. Finigan, Former SPI Circulation Manager, Dies

CHARLES I. FINIGAN, long-time circulation manager of the W. R. C. SMITH PUBLISHING CO., died in an Atlanta hospital on August 18. He was 68 years of age.

A native of Montgomery, Ala., Mr. Finigan was circulation manager of the *Montgomery Advertiser* for several years. He became connected with the W. R. C. Smith Publishing Co. in 1919 and continued as circulation manager until his retirement, because of illness, in 1951.

### Trane Names Hackl—Dallas

Appointment of A. JAMES HACKL as manager of the DALLAS sales office has been announced by THE TRANE COMPANY, La Crosse, Wisconsin, manufacturers of air conditioning, heating and ventilating equipment.

Hackl had been associated with the JACKSON, MISSISSIPPI, sales office for four years prior to his commissioned officer reassignment in the U. S. Navy in 1951.

He has a mechanical engineering degree from the Georgia Institute of Technology.

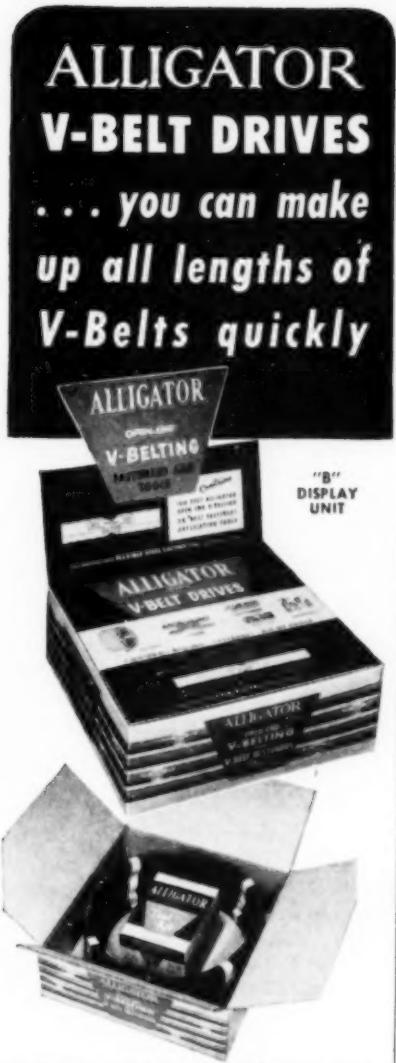
### Flexible Steel—S. E.

HOWARD GILL, native of Mississippi and a graduate of Georgia Tech, will cover the states of MISSISSIPPI, ALABAMA, GEORGIA, FLORIDA and western TENNESSEE for the FLEXIBLE STEEL LACING CO., manufacturers of belt fasteners for joining conveyor and transmission belts.



Howard Gill

This territory was formerly covered by Austin Webster who has retired after many years of service.



- ★ Units contain V-Belting, Fasteners and Tools — everything you need in one package for all emergencies when correct endless V-belt is not available.
- ★ Avoid costly delays, shut-downs and pickups.
- ★ Eliminates costly dismantling of machinery when re-beling.
- ★ Completely modern make-up units that give you peace of mind as well as stock on hand.
- ★ Less Stretch and Follow-Up Maintenance. Just One Strong Joint.
- ★ Alligator V-Belt Drive Units, available in sizes A, B, C and D. B size furnished in display box.
- ★ Order from your distributor. Ask for Bulletin V-215.

**FLEXIBLE STEEL LACING CO.**

4625 Lexington St., Chicago 44, Ill.

#### New York Belting & Packing SE-SW Distr. Sales Changes

NEW YORK BELTING AND PACKING CO., Passaic, N. J., has announced three changes in its district sales organization.

WILLIAM I. BUTLER, manager for the Southeastern district, with offices in MEMPHIS, has been named district manager for the east central states with offices in Cleveland. His current post will be filled by WILLIAM W. CONARD, who will make his headquarters in ATLANTA.

It was also announced that MALCOLM B. ROACH, sales engineer, has been appointed assistant manager for the Southwestern district with headquarters in DALLAS.

#### Leschen Wire Rope Division Appoints Dickson—St. Louis

RUSSELL J. DICKSON has been appointed General Sales Manager, LESCHEN WIRE ROPE DIVISION of H. K. PORTER COMPANY, INC., ST. LOUIS. Mr. Dickson has been with Leschen for more than three years as Chicago District Manager.

#### Black, Sivalls & Bryson Shreveport and Ft. Worth

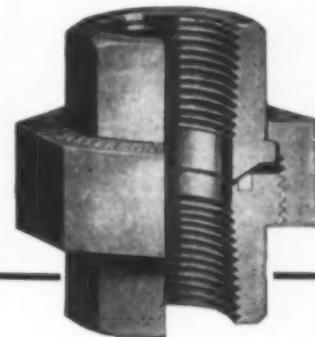
BLACK, SIVALLS & BRYSON, INC., 7500 E. 12th St., Kansas City 3, Mo., have announced the appointment of JIMMY SIMMONS as SHREVEPORT District Sales Manager.

Simmons, with BS&B for the past 13 years as a salesman in Corpus Christi and Alice, will have supervision of sales and service activities of the Controls and Safety Head Division in the Shreveport sales district. Simmons will have offices on New Minden Rd., Bossier City, Louisiana, which is also the Oilfield Sales Division headquarters for the Shreveport area.

The company has also announced the appointment of TOM McQUIRE as FT. WORTH District Sales Manager.

McQuire has been with BS&B for the past 6 years as a salesman in Dallas and Ft. Worth. In his new capacity, he will have supervision of sales and service activities of the Controls and Safety Head Division in the Ft. Worth sales district. McQuire's offices are located in the Sinclair Building, Room 906, which is also the Oilfield Sales Division headquarters for the Ft. Worth area.

#### Preference is for ...



*jefferson*  
**UNIONS**  
because:

... they are easier to set up  
and permanently leakproof

The following details of design and construction of Jefferson Unions contribute to their outstanding performance and economy:

... made of air-refined malleable iron having a tensile strength of 55,000 p.s.i.

... leakproof tightness assured by a true spherical brass seat recessed so as to avoid pipe ends ever coming in contact with it.

... seat rings of drawn seamless brass tubing press-fitted into machined channels so that they cannot rock loose.

#### A Type and Size for Every Service

Completeness of the Jefferson line simplifies piping installation and saves material. The line includes: unions, union elbows and union tees in Jefferson 300#, Excel 250# and Master 150#; also flanges in Jefferson 300# and unions in Enduro 300#. All lines are also available with all-iron seats. Underwriters approved.

Get in touch with your nearest distributor or with us direct.

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UNION CO.**

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79 Gooding St., Lockport, N. Y.  
45 Fletcher Ave., Lexington 73, Mass.

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- Industrial Gas Burners
- Combination Gas and Oil Burners
- Tandem Block Combustion Units
- Fuel Oil Pump Sets
- Refractory Burner and Muffle Blocks
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**news for the South and Southwest (continued)**

**Swartwout—St. Louis**

Appointment of F. S. CROOK COMPANY, manufacturers' representatives, 455 Paul Brown Bldg., St. Louis, to represent the SWARTWOUT COMPANY'S Roof Ventilator division in that area is announced by J. P. Johnson, ventilator division sales manager.

FREDERICK S. CROOK and FRANK H. LEONARD are well known in the area, having operated for more than eight years as sales representatives for steam generators, sewerage treatment equipment, filter and swimming pool equipment and other industrial apparatus.

**Combustion Control Corp.  
Appoints John M. Englisby**

COMBUSTION CONTROL CORPORATION, Boston, Mass., manufacturer of Fireye Flame Failure Safeguard Controls, announces the appointment of JOHN M. ENGLISBY as Eastern Regional Sales Manager. He will direct sales activities from the office located at 1 Broadway, New York City.

**U. S. Hoffman—Houston**

The Industrial Filtration Division, U. S. HOFFMAN MACHINERY CORPORATION, Syracuse, N. Y., has announced the appointment of RALPH EADS as sales representative in HOUSTON and Southern TEXAS.

Mr. Eads has been operating as the Eads Company at Houston. He has been active in sales engineering in the area for the past seven years.

**Diamond Alkali—Florida**

DIAMOND ALKALI COMPANY has announced the appointment of CHARLES P. EGOLF III as sales and service representative for the state of FLORIDA. Mr. Egolf, whose home is in Lakeland, will handle the complete line of Diamond's numerous chemicals.

For the past year Mr. Egolf has been employed as a research chemist by the Food Machinery & Chemical Corp. at Lakeland, where he was engaged in a quality control program on citrus products which included "trouble-shooting" at the canning plants. Prior to that time, he was a research chemist with the International Minerals & Chemical Corp. at Mulberry.

**Jefferson Union—Atlanta**

JEFFERSON UNION COMPANY, Lexington, Mass., has announced the appointment of NEEL ASSOCIATES, ATLANTA, GEORGIA, as its Southeastern sales representative.

Mr. R. W. Neel, who heads the firm, is well known to engineers in the Southeast because of his long service with Manning, Maxwell & Moore.

**Pennsalt—Kentucky**

The new \$8,000,000 electrolytic chlorine and caustic soda plant at the CALVERT CITY, KENTUCKY, works of the PENNSYLVANIA SALT MANUFACTURING CO. is now in production.

The new DeNora electrolytic cells have been charged with brine made from Louisiana salt and activated with TVA power and are now producing chlorine and high purity, high strength caustic soda. Chlorine and hydrogen from the cells are being combined in the new anhydrous hydrogen chloride unit, and deliveries of these basic chemicals have started.

**Owens-Corning—Memphis**

Industrial activity in the MEMPHIS-NASHVILLE-LITTLE ROCK area has prompted OWENS-CORNING FIBERGLAS CORPORATION to establish a full-time branch office at the Dermon Bldg. in Memphis.

WILLIAM F. HARTNETT, who has been appointed manager of the Memphis Fiberglas office, has been the company's sales representative in Memphis since 1949.

ALLEN CRAIG will continue to sell Fiberglas products in the Nashville area. MARTY DUNCAN, a Fiberglas salesman in St. Louis since October, 1952, will represent the company in Little Rock. WILLIAM A. JUENGER, presently assigned to the St. Louis territory, will, in addition, sell Fiberglas textile products in the Memphis area.

**Iron Fireman—N. C.**

A. M. STEPHENSON, who distributes Iron Fireman automatic heating and power equipment for commercial and industrial applications, has organized the HEAT & POWER EQUIPMENT COMPANY and hereafter will do business under that name. The address remains 1605 Elizabeth Avenue, CHARLOTTE, NORTH CAROLINA.

# WHAT'S NEW and Where to Get It

*Free literature on the latest developments in equipment and supplies is offered by leading manufacturers. For your copy, circle the item number on one of the reader service post cards provided on pages 17 and 18.*

**V-1 VALVE CONTROL**—Bulletin 528, 16 pages—Gives design data for remote control of valves up to and including those with 27 in. diameter hand wheels, by use of flexible shafting. Different types of end connections are shown in detail. Illustrated with photographs and drawings.—STOW MANUFACTURING CO., Binghamton, N. Y.

**V-2 PORTABLE ELECTRIC TOOLS**—Catalog No. 39-A, 40 pages—Gives complete illustrations, descriptions, specifications, and prices on all Thor universal electric industrial tools including drills, grinders, hammers, saws, screwdrivers, nut setters, sanders, polishers, tappers, nibblers, balancers, impact wrenches and other items.—THOR POWER TOOL COMPANY, 175 North State St., Aurora, Ill.

**V-3 MATERIALS HANDLING**—Revised Booklet, 28 pages—“The How Book of Cost-Cutting Materials Handling” incorporates latest methods for analyzing materials handling operations in plants and warehouses. Illustrates skids and pallets available and shows how they can be used most efficiently. Describes industrial power trucks and hand trucks.—THE YALE & TOWNE MANUFACTURING COMPANY, 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

**V-4 CUSHIONED VALVE**—Bulletin W-8, 4 pages—New Flowtrol valve to replace troublesome gate valves that require frequent manual operation or diaphragm valves is described including design and construction features, complete design list, dimensions and specifications. Illustrated.—GOLDEN-ANDERSON VALVE SPECIALTY CO., 2073 Keenan Bldg., Pittsburgh 22, Pa.

**V-5 SCREW THREADS**—Bulletin No. 662, 4 pages—Screw threads are discussed with emphasis on relative merits of coarse and fine threads. Covers torque effort, adjustment of bolt tension, loosening in vibration, load distribution on successive threads, static tensile strength, fatigue strength, corrosion resistance, and other features.—HELI-COIL CORPORATION, 1387 Shelter Rock Lane, Danbury, Conn.

**V-6 PACKINGS**—Catalog, 112 pages—Covers proper installation and care of packings, including selection for various installations, metric engineering tables and conversion charts for both centigrade and Fahrenheit temperatures, maintenance data for rod and plunger packings and gaskets. Chart gives chemical resistance of gasket materials and tables show melting points and specific gravity of various materials.—UNITED STATES RUBBER COMPANY, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

**V-7 ARC WELDING MACHINES**—Catalog 1340, 44 pages—Illustrates and describes over 20 different models of arc welding machines including a.c., d.c. and inert gas models with specifications, design and construction features, and electrical data. Covers accessories and electrodes.—AIR REDUCTION SALES COMPANY, 66 East 42nd St., New York 17, N. Y.

**V-8 FIRE EXTINGUISHERS**—Bulletin 188R, 8 pages—Describes all types of portable fire extinguishers for Class A, B, and C fires. Outlines smoke and temperature rate of rise fire detection systems as well as automatic carbon dioxide extinguishing systems for machinery and entire rooms.—WALTER KIDDE & COMPANY, INC., Main Street, Belleville 9, N. Y.

**V-9 FLOW METER**—Bulletin 500, 16 pages—Information on operation, construction, accuracy, primary devices and other general data of interest to power, process and sanitation engineers who deal with fluid flow problems. Describes instrument which provides means of obtaining accurate measurement of fluid flows over wide ranges and is designed for water, sewage, sludge and Industrial Liquors.—SIMPLEX VALVE & METER COMPANY, 6th and Upland Sts., Philadelphia 42, Pa.

**V-10 SPREADER STOKER**—Bulletin No. 800, 16 pages—Illustrates and describes the RotoStoker Type C-C, a relatively small spreader stoker for boilers and steam generators from approximately 5,000 to 75,000 pounds per hour steam output capacity, adaptable to all types and makes of modern steam boilers and steam generators, and offering the recognized continuous cleaning and ash discharge advantages of larger types of spreader stokers without the necessity of a basement for ash removal. Explains the automatic operation in which fuel supply, air supply, and ash discharge are synchronized with steam demand.—DETROIT STOKER COMPANY, General Motors Bldg., Detroit 2, Mich.

**V-11 WATER CONDITIONING**—Data Book No. 2478A, 108 pages—Covers hydraulics, impurities in water, chemicals used in water treatment, specific gravities and chemical reactions. Includes 78 tables of engineering information.—THE PERMUTIT COMPANY, 230 West 42nd St., New York 36, N. Y.

**V-12 HEATING SPECIALTIES**—Catalog H-99, 16 pages—Features convenient and simple circulator performance curves, simple heater selection charts, and complete information on all Taco heating specialties and accessories.—TACO HEATERS, INCORPORATED, Adv. Dept., 137 South St., Providence, R. I.

**V-13 HEAVY-DUTY CLEANER**—Service Report, 3 pages—Oakite Composition No. 26, a new detergent designed to remove extra heavy soils from iron and steel in one operation, is described. Purpose, method of application, and suggested uses are covered, including recommended temperatures and concentrations.—OAKITE PRODUCTS, INC., 122A Rector St., New York 6, N. Y.

**V-14 SCAFFOLDS**—Folder No. 52, 4 pages—Explains applications of Advance tubular steel Rolling Scaffold Towers for all types of maintenance and construction work. Patented method of locking braces to panels and panels on panels is included. Illustrated.—BEAVER ART METAL CORP., Advance Scaffold Division, Dept. A 26, Ellwood City, Pa.

**V-15 PIPE COUPLINGS**—Folder No. 101, 6 pages—Describes new Dual-Purpose Coupling-Repair Clamp available for pipe engineering and maintenance work. Explains application for coupling or repair of gas, water and petroleum pipe lines, including price and specification data. Outlines 6-step method of assembly.—MORRIS COUPLING AND CLAMP CO., Dept. J-54, Ellwood City, Pa.

**V-16 GEARMOTORS**—File PB 18000-1, 653, 4 pages—Illustrates and describes a new line of gearmotors featuring a wide selection of compact, integral power units with single (780 to 280 rpm), double (230 to 45 rpm) or triple (37 to 7.5 rpm) speed reduction. Discusses design, construction, and application.—ELLIOTT COMPANY, Jeannette, Pa.

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(Basic Principles of Steam Plant Practice)

By A. D. HOLLAND  
 Assoc. Prof. of Mech. Engr., Georgia School of Technology

"Fundamentals of Boiler Plant Engineering"—is different from most handbooks in that it goes into the fundamental principles of boiler plant operation. It is written so that it can be studied by those who have not had an opportunity to learn these basic laws; at the same time its many charts, tables and formulae make it a valuable reference book for the trained engineer.

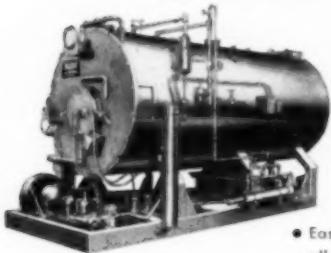
The basic principles covered in this book have such wide application that it will be extremely helpful to refrigeration, air conditioning, textile and hydraulic engineers and master mechanics. Stiff cover, cloth binding,  $4\frac{1}{2} \times 7$  inches, 232 pages, 37 tables, 55 illustrations, 30 memorandum pages for your special notations. "FUNDAMENTALS OF BOILER PLANT ENGINEERING" may be secured with a 3-year subscription to SOUTHERN POWER & INDUSTRY for \$3.00.

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"Fundamentals of Boiler Plant Engineering"—is different from most handbooks in that it goes into the fundamental principles of boiler plant operation. It is written so that it can be studied by those who have not had an opportunity to learn these basic laws; at the same time its many charts, tables and formulae make it a valuable reference book for the trained engineer.

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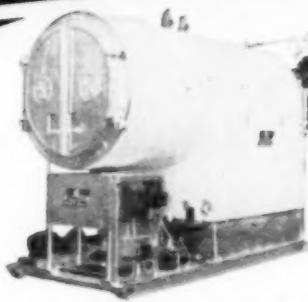
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60 H.P. Unit  
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Gas Co.



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SPROCKET RIM  
with Chain Guide

Control out-of-reach overhead valves right from the floor! No more climbing on ladders, balancing on boilers, perching on workbenches or machines. Prevent accidents and costly claims — also save fuel, steam and money.

Only four simple, quickly-assembled parts installed and operating in only a few minutes. Babbitt Adjustable Sprocket Rim with Chain Guide —

- Fits all valve wheels
- Simplifies pipe layouts
- Eliminates risky climbing

Range of 10 adjustable sizes fits all valve wheels from 2 to 30 inches diameter, with rising or non-rising stems.

Call your Industrial Distributor. He carries complete stocks.  
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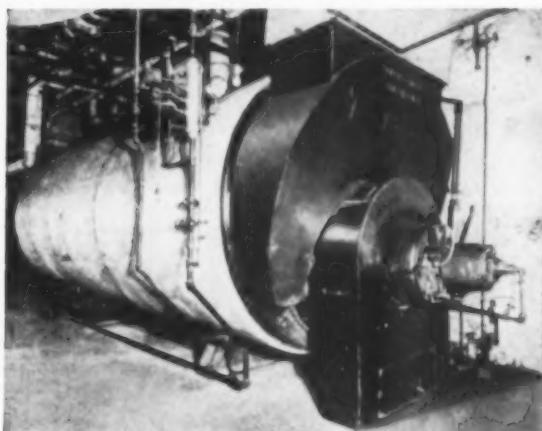


**Babbitt STEAM SPECIALTY CO.**  
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## FARRAR & TREFTS, INC.

Established 1863

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Heating and Power Boilers in sizes ranging  
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# ATLAS

## TEMPERATURE REGULATORS

*are made for*

## EVERY SERVICE



Your temperature regulating problems, no matter how tough, can be handled by ATLAS Engineers. You can place your problems in their hands with confidence because the making of regulating valves has been our ONLY business for more than a half century.

For example, every American is proud of the achievements of the new ocean liner—the

### S.S. UNITED STATES.

On page 144 of the Sept. 1952 issue of MARINE ENGINEERING & SHIPPING REVIEW you will find that ATLAS is credited with furnishing: "Valves, regulators and strainers (composition reducing valves, composition pressure reducing valves, combined pressure and temperature regulators, composition strainers)"—all on the S.S. United States.

### Where Are They Used?

ATLAS Temperature Regulators are used to control the temperature of water, fuel oil, and other liquids in all kinds of open and closed tanks and heaters which are heated by steam or gas. Those listed below are completely described in our Bulletins No. 6-A and 7-A. Ask for a copy of each.

No. 650, Balanced Type Double Seat Valve, Spring Adjustment. Sizes  $\frac{1}{2}$ " to 6" inclusive.

No. 651 and 653, Needle Type Single Seat Valve, Spring Adjustment. Sizes  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " inclusive.

No. 655, Balanced Type Double Seat Valve, Lever and Weight Adjustment. Sizes  $\frac{1}{2}$ " to 6" inclusive.

No. 660 and 662, Single Seat, Self-Contained, Pilot Operated for High Pressure Steam. Sizes  $\frac{1}{2}$ " to 4" inclusive.

Nos. 612-651 and 612-653, Combination Temperature and Pressure Regulator. Sizes  $\frac{1}{2}$ " to 4" inclusive.

No. 651-ES Combination Temperature and Pressure Regulator. Sizes  $\frac{1}{2}$ " to 2" inclusive.

No. 6 Thermostat, Pneumatically Operated.

No. 12 Thermostat, Hydraulically Operated.

See list of the principal ATLAS products below.

## ATLAS VALVE COMPANY

REGULATING VALVES FOR EVERY SERVICE

275 South St.

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### Agents in Principal Cities of the South

Campbell Boiler Feed  
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Temperature Regulators  
Reducing Valves  
Exhaust Control System  
Pressure Regulators

Pump Governors  
Damper Regulators  
Back Pressure Valves  
Balanced Valves  
Control Valves  
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## The Marvelous Montgomery

### BLO-HOG

(The only all-purpose hog in the world)

### Eats Up Everything!

Patents Pending



. . . including Pine, Oak, Gum, Hickory, Elm, Wet Veneer, Round-up and Sandy Bark. Conveyor-fed—no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

" . . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant—which means a considerable saving.—J. B. Black, Plant Superintendent, Ocala Manufacturing, Ice and Packing Co., Ocala, Fla."

C.I.T. Terms Available



Write for bulletin and details

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P. O. Box 3687, Jacksonville, Florida

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Hotel Pittsburgher  
PITTSBURGH, PA.



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A Knott Hotel

JOSEPH F. DUDDY, MANAGER



## A Four-Way Selection

This photograph of a weather vane seems a good way to point out the fact that there are four different types of Midwest Welding Elbows (see below). These are more types than are manufactured by any other company. This greater selection is important to users of welded piping because it gives the engineer greater latitude in piping design and permits improvements and economies not otherwise possible in welded piping systems. For more information on this subject, ask for Catalog 48.

### MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second Street, St. Louis 4, Mo.  
Plants: St. Louis, Fossolic, Los Angeles and Boston  
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### STOCKING DISTRIBUTORS IN PRINCIPAL CITIES



#### MIDWEST "LONG TANGENT"

Same radius as ABA but deflection equal to 25% of nominal pipe size on each end. Same pipe, layout and welding time. Costs no more than 10%. Sizes up to 30".



#### ABA STANDARD

Dimensions conform to applicable size range of American Standard for Butt-Welding Fittings, ASME B16.9. Tolerances much less than allowable. Sizes up to 30".



#### SHORT RADIUS

Recommended where space is limited. Sizes to 30". Also available with "Long Tangents" in sizes 14" to 30".



#### MIDWEST REDUCING

Takes the place of a straight size, elbow and a reducer. Eliminates two welds, reduces pressure drop, makes it lighter. Sizes up to 12", reduce sizes in half sizes.

# MIDWEST WELDING FITTINGS

IMPROVE PIPING DESIGN AND REDUCE COSTS



**Atlantic City Electric Company  
selects  
PERMUTIT WATER CONDITIONING**

with **centralized, automatic control!**

Greenwich Station. Normal steam capacity: 460,000 lb per hr. Engineered and constructed by Burns and Roe, Inc., New York City.

**T**O FILL changing demand for 100% makeup with highest purity feedwater requires the best of equipment and a degree of efficiency obtainable only with modern automatic control.

At the Greenwich Station, instrumentation — centralized in Permutit cubicles — provides this control. The water-treatment plant supplies makeup that meets requirements for two 650 psig boilers operating under wide ranges in load . . . for steam output and turbo-generator exhaust must also fill the changing process-steam needs of a very large, nearby chemical plant.

**TREATMENT METHODS SPECIFIED**

Consulting engineers investigated several plans to determine the most efficient and economical means of making Delaware River water satisfactory for two 230,000 lb per hr boilers. Final decision was to treat the water with Permutit equipment:

coagulation, silica reduction, filtration, hydrogen-sodium-zeolite softening, degasification . . . with provision for demineralization if required.

**REQUIREMENTS FOR COMPLETE CONTROL**

Mounted on the Permutit central control board are flow controllers and loss of head gauges for each filter; flow recorders, level indicators, alarms, timing devices, etc. A pH indicator assures proper blending of the sodium and hydrogen-zeolite softened waters. After setting flow rates, timing elements, etc., this entire Permutit water-treatment system operates automatically!

Find out how Permutit can solve your water problems. Write to THE PERMUTIT COMPANY, Dept. SI10, 330 West 42nd Street, New York 36, N. Y. or Permutit Company of Canada, Ltd., 6975 Jeanne Mance Street, Montreal.

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